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DECEMBER 1948

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— IN THIS ISSUE —

AMATEUR RADIO

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EDITORIAL

★

Due to increases in population and changes in economic standards, modern trends are towards the decentralisation of effort and thought. This statement may well apply to the trends in Amateur radio also.

With the numbers of licenced amateurs rapidly increasing since the War, at a rate greater than ever predicted, it must inevitably lead to large proportions of such amateurs being licenced in the country areas, away from the capital cities. Up to the present time, the main social and political interest in the Institute has been maintained in the capital cities.

Now, as never before, we are confronted with bodies of amateurs in extra-urban areas anxious to band themselves together in a club, or pressing for the formation of Sub-branches, in order to promote some local activity of social or experimental interest. This fact has already been evidenced in some of the larger inland towns of New South Wales and Victoria. Our parochial outlook on centralisation must change—we must take a greater interest in the welfare of these isolated-from-the-city amateurs.

The Sub-branch or Club can be of great assistance to the Divisional Council of the Institute, in matters affecting Divisional, and even Federal policy, by providing a wider and more representative amateur feeling towards any particular question. From the social side alone, they must provide an essential part of an out-of-town amateur's existence.

So the fostering of such Sub-branches or Clubs become increasingly important; but, at the same time, it is necessary from unity alone that they be Sub-branches of, or at least affiliated with, W.I.A. In unity only is there strength, and it is strength that Amateur radio needs to-day. So for Amateur radio in general and the Divisions in particular, assistance to these bodies is essential, for a lack of individual interest will allow break-away groups to develop who can retard and disrupt the work the W.I.A. is carrying on for the well-being of the individual amateur.

You, as an individual member of the W.I.A., may assist by freely offering your services to your Divisional Council to officially develop the club feeling in your own area, where the formation of a Sub-branch is a necessity in the interests of the Institute, and most important, of local harmony.

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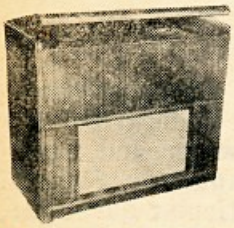

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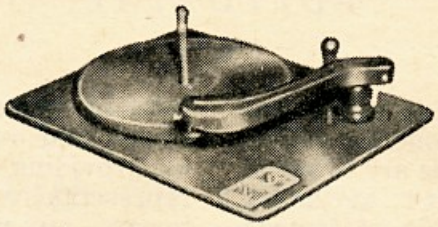

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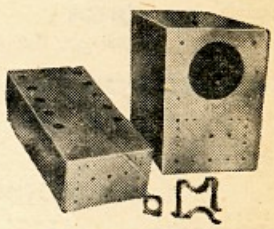

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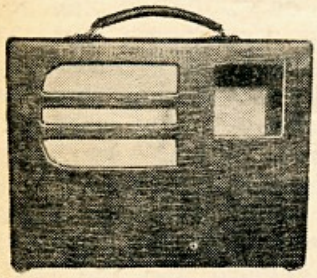

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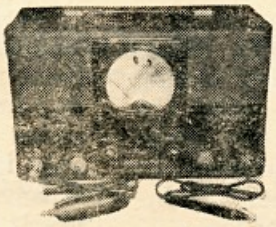

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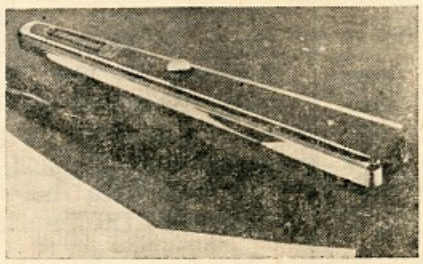

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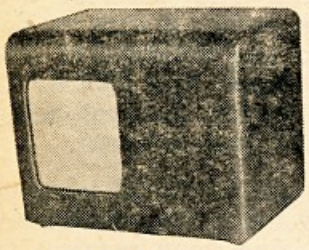

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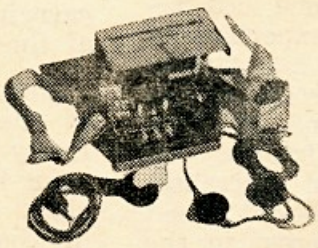

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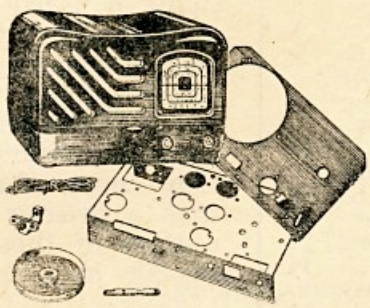

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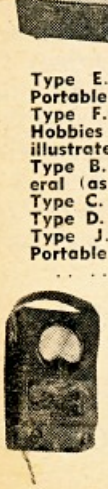

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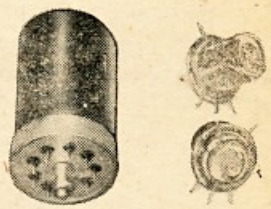

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Propogation of Waves Between 3 and 30 Mc.

BY NEIL S. SMITH*, VK3YY

PART II.†

It will be recalled that medium wave services are mainly dependent on ground wave signals and that particular attention is paid to reducing skywave radiation to a minimum. High frequency services on the other hand depend on skywave radiation and not at all on the ground wave, and design considerations are mainly related to directive skywave radiation.

THE IONOSPHERE Radio transmission over medium and long distance is rendered possible by the existence of a region of ionised layers in the earth's upper atmosphere, extending from about 40 to 260 miles above the earth's surface. These layers possess the characteristic of reflecting radio waves incident upon them, and of exercising a certain amount of frequency discrimination in the process. The arbitrarily defined frequency limits are 3 and 30 Mc. The transmission path of an h.f. signal is therefore from the transmitter to the ionosphere and back to earth, the number of times which this occurs depending on the distance between the transmitter and receiver and other factors to be discussed.

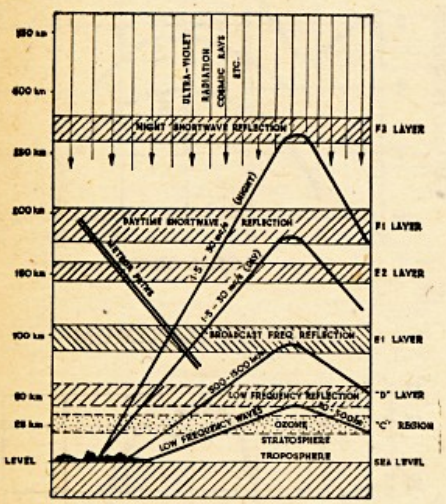

Fig. 1.

The chief factor in the formation of the ionosphere is considered to be ultra-violet radiation from the sun, which ionises air particles in this region. Fig. 1 shows in an elementary way a picture of the earth's atmosphere.

The air at this height is so rare (i.e. the particles are relatively remote) that once the particles become ionised recombination is so slow that there exists always a region of ionised particles.

This ionisation is not uniformly distributed with altitude but tends to become stratified giving rise to several well defined layers. The density of each layer decreases towards the earth, and their overall density varies in a similar manner.

In order to identify them the layers have been given letters, and those termed E, F, F_1, and F_2 are those we are primarily concerned with in this paper.

The E, F_1, and F_2 ordinarily exist in the daytime. At night E decreases in effect, and F_1 and F_2 merge into F.

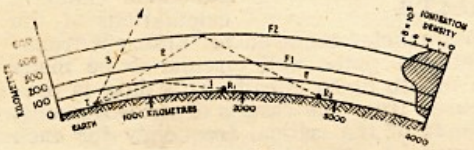

Fig. 2a.

Figure 2a shows in elementary form the ionisation structure for a typical summer day. The layers are shown with single lines for simplicity although they are really bands of varying density. Fig. 2b shows in a little more detail the variation of density with height.

The height and density of a particular layer will vary at different times of the day, at different seasons, and with the period of the sunspot cycle. Average heights suitable for estimating transmission frequencies may be taken as:—

E layer 45-90 miles—mostly useful in daytime.

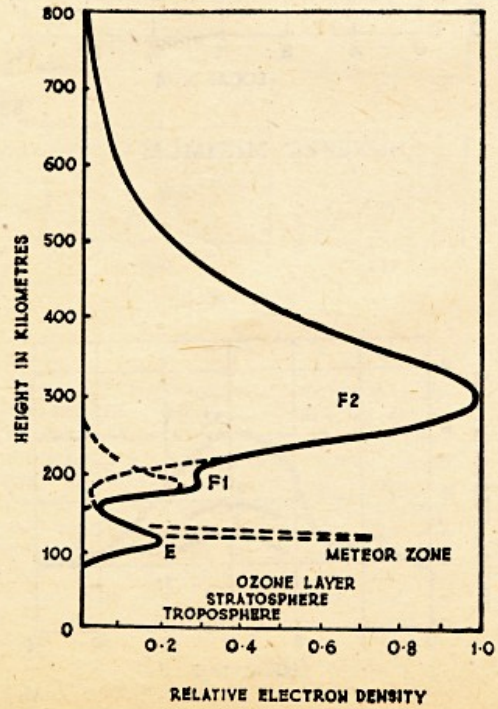

Fig. 2b.

F_1 layer 86-155 miles—Daytime (occasionally absent in winter).

F_2 layer 155-280 miles — Daytime (summer).

F_2 layer 94-190 miles—Daytime (winter).

F layer 110-250 miles—Night (merging of F_1 and F_2).

Briefly, each layer may be regarded as reflecting a certain band of frequencies, the actual values depending on the diurnal, seasonal, and cyclic variations of density and height, as well as on the angle of transmission and the distance of the path. Three typical paths are shown in Fig. 2a; Path 1 being from T to R_1 via the E layer, Path 2 from T to R_2 via the F_2 layer, and Path 3 which is on a frequency and at angle which does not suffer reflection from any layer, and is lost in space.

The factors to be deduced from the above are of importance and may the better be appreciated by reference to Fig. 3, which shows the three layers usually present during the day. In the figure T represents a transmitter and R a receiving area. Since the ray leaves

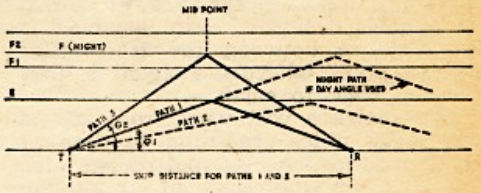

Fig. 3.

the layer at the same angle at which it entered, it is usual to consider the mid-point of the path as the reflection point. Path 1 shows the path of a signal from T to R using the E layer. If the transmission angle is too low, say Path 2, the reflection will occur beyond the mid-point and the signal will return beyond R. If the angle were doubled, R would be reached in two hops, but there would be some additional attenuation due to reflection losses both from the ionosphere and the ground. Consider the night condition when E is unuseful and the F layer provides the required reflection. If transmission was made the signal would take the dotted path to the F layer and be returned far beyond R. In order to keep the reflection point at the mid-point of the path, the angle must change so that the signal will follow Path 3.

Although this sounds complicated, it is usually accomplished by merely changing the frequency of the transmitted signal. It will be appreciated by now that each layer will have a "last" frequency to be reflected from it before the signal goes through to the next layer. This frequency is termed the

† Part I. appeared in July, 1948.

* 14 Durham Road, Surrey Hills, E.10.

"critical" frequency for the particular layer and may be explained by reference to Fig. 4, which shows how the relative density of the layers varies from the lower edge to the upper. The depth of penetration is a function of the frequency of the signal and increases as the frequency increases. If we send a signal of increasing frequency into the ionosphere we will eventually find a frequency which goes through the first layer to the second, and ultimately one which goes through all layers and is not reflected at all. It is customary to refer to the distance covered by a once-reflected signal as a "hop," thus we have "single-hop" and "multi-hop" transmissions. The first term applies in general to internal services and the second to the overseas services.

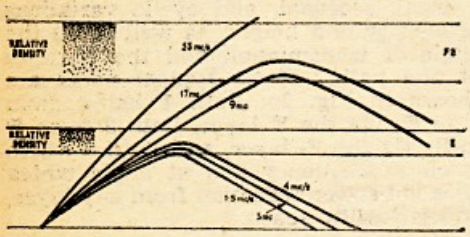

Fig. 4.—Illustrating the variation of density on signal frequencies.

SKIP DISTANCE This is a factor of particular importance in the case of internal services since there is generally a minimum limiting distance at which reception is desired. "Skip distance" is the distance between the transmitter and the point where the signal is first reflected back to earth.

This distance will vary from 200 to over 2,000 miles according to time of day, frequency, and sunspot period, etc., and thus in the case of single-hop transmissions a constant check has to be kept on this factor to ensure reception over the areas relatively close to the transmitter.

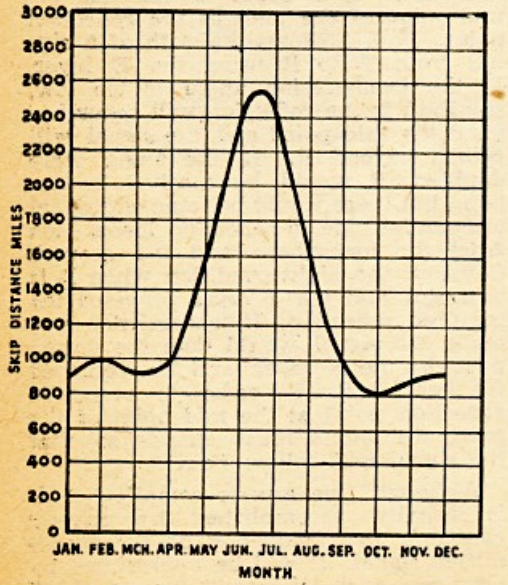

Fig. 5.—Variation of skip distance for 9 Mc., at 0600 hours E.S.T.

Fig. 5 shows how the skip distance for 9 Mc. may vary over 12 months at 6 a.m. Australian Eastern Time and for a reflection point between 25° and 35° South latitude.

SUNSPOT CYCLES Reference was made to the sunspot cycle which extends over a period of 10 to 12 years but is not constant either in time or number of sunspots. A detailed explanation is not requisite here, but Fig. 6 is included to show the variation to be expected in critical frequencies for summer and winter conditions at the maximum and minimum periods of sunspot activity. Particularly noticeable is the change for winter. The skip distances would vary in the same ratio.

PROPAGATION DATA Data is regularly published enabling calculations of the frequencies required for different transmission paths and circuits to be made a month or so ahead. This data is prepared from the results of measurements made of the critical frequency for each layer. A little elaboration of this seems desirable, since many administrations co-operate in the compilation and application of this data.

Method of Ionosphere Investigation.—By means of investigations conducted concurrently throughout the world the condition of the ionosphere for radio transmission between all parts of the globe is ascertained. The results of these tests are co-ordinated and radio propagation bulletins published by various authorities controlling communication services.

One of the most useful systems is, perhaps, that known as the pulse method. In this method, short wave trains lasting possibly 10^{-4} seconds are transmitted vertically upwards. A locally situated receiver picks up both the direct and reflected pulses. The out-

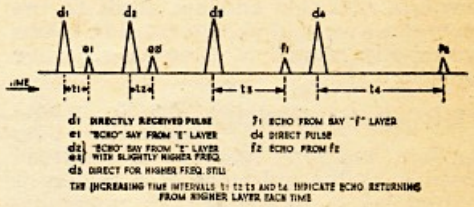

Fig. 7.

put of the receiver is applied to some form of oscillograph having a suitable time-base. The time interval between the direct pick-up and the echo signal is determined from the time-base and is readily converted into distance since the velocity of the radio wave is known (300×10^6 metres per second). Figure 7 illustrates this point.

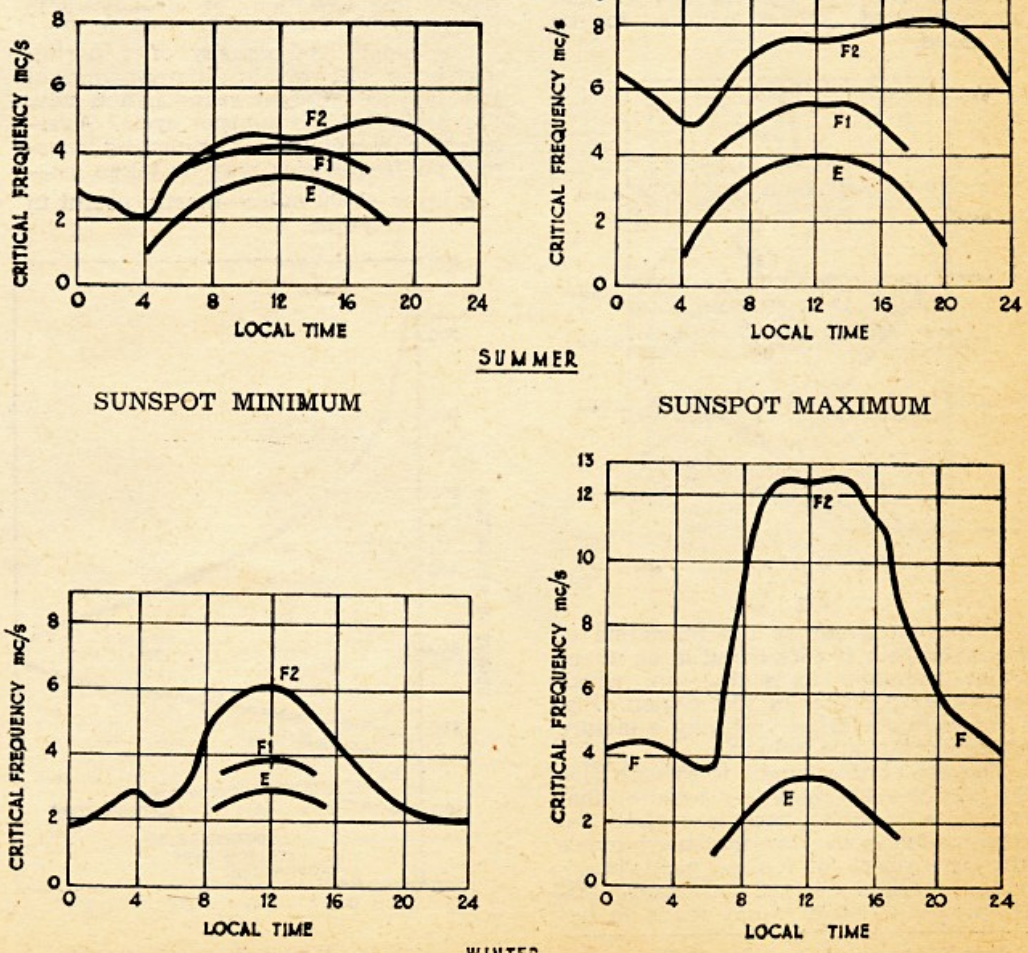

Fig. 6.

Equipment developed for these measurements transmits 10 to 60 pulses per second, with the frequency changing between each group of pulses so that a range of perhaps 1 to 20 megacycles per second is swept through in about 20 minutes.

During this series of tests it is necessary that the transmitter and receiver be accurately tuned to the same frequencies. This is accomplished by a synchronising circuit. A typical set-up is illustrated in Fig. 8, while Fig. 9 shows a convenient method of representing the information obtained by this measuring technique.

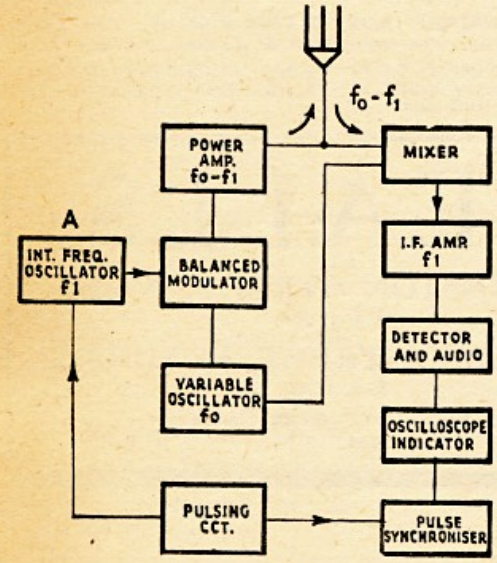

Fig. 8.

Commencing with the first frequency there will be a very slight difference only in the echo time as the frequencies penetrate more deeply into a layer, until the point at which the frequency penetrates through the layer to the next higher layer. The time interval will noticeably increase when this happens indicating that the signal has travelled to the next layer. The last signal (i.e. the one previous to this) is termed the "critical frequency" for that layer, and this frequency should not be exceeded for transmission via this layer. Actually the highest frequency it is safe to use is about 80% of this value to allow for day to day variations in layer height.

Nothing now remains but to relate these vertical incidence measurements to the practical cases where transmission takes place at angles between about 7° and 40° above the horizontal.

What is done is relatively simple; the transmission angles for distances from 500 to 2,500 miles in steps of 500 miles are determined. The vertical incidence critical frequencies are multiplied by a factor (always greater than 1) depending on this angle and the resultant frequency is the critical frequency for that particular layer and angle of transmission. The actual factor depends on latitude, longitude, time, season, and the sunspot period, thus the graphs will vary from month to month and year to year. A typical presentation is shown in the graphs in this issue of the magazine.

Absorption limited frequency, and lowest useful high frequency.—This procedure determines the maximum usable frequency for particular conditions but does not indicate how much below this frequency satisfactory transmission may take place. It might be thought that any frequency below the m.u.f. could be used, but it is recommended that the frequency used be not less than 50% of the m.u.f.

There are other factors, however, which set the lower frequency limit, and of interest are "the absorption limited frequency" and the "lowest useful high frequency" abbreviated "a.l.f." and "l.u.f." respectfully. These represent two different approaches to the determination of the lower frequency limit.

It is generally accepted that satisfactory propagation of h.f. signals is effected only by reflections from the F layer. In long distance circuits, however, a condition can arise, where at some intermediate point, the E layer density is such that it exerts a controlling influence on the circuit. The E layer will have a maximum usable frequency and this m.u.f. may be lower than that determined by calculation at the terminal points. When the signal reaches this area it will be unable to penetrate through E to F, and in the process of reflection from E, it is very highly attenuated. Transmission can only take place when the signal frequency is higher than the m.u.f. of the E layer at this point, and it is not always possible to fulfil this condition.

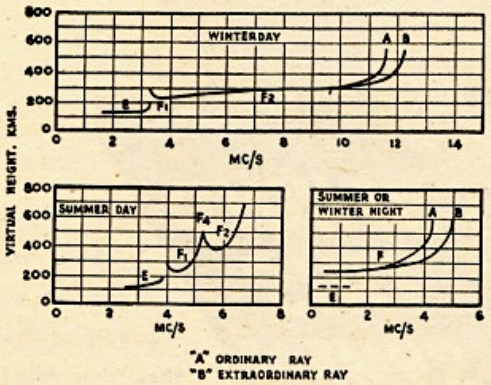

Fig. 9.

The l.u.f. is determined from a consideration of many factors, among which are: solar absorption, time of day, season, effective transmitter power, local noise conditions at receiving terminal, type of service (telegraphy, telephony, broadcasting), aerial systems, etc. It does not appear to be appreciably affected by the sunspot cycle, but investigations are still being conducted to determine more fully these characteristics.

The foregoing is a brief picture of propagation up to about 30-40 Mc. Above these values "line-of-sight" transmission predominates, the higher frequencies in general suffering no reflection from the normal layers.

THE WHY OF ODD VALUES

After listening on the bands and having discussions with various Hams, there appears to be some confusion as to why odd values of capacity and resistance are appearing in circuit diagrams. However there is a good reason for this when it is understood why.

There is a new system of numbering being used now and this is based on the idea that permissable tolerances in values are what counts. Starting with 1 (10, 100 or any decimal multiple) values increase logarithmically so that each higher value represents a constant percentage increase over the value immediately below it. In practice, the values are rounded off to two significant figures, this order of accuracy being enough to give a complete range of the smallest tolerance (5%) ordinarily required.

A summary of values from 10 to 100 is given in Table 1. Larger values are found by multiplying by 10 or any multiple of 10, smaller values by dividing by 10 and its multiples.

Many of the old numbers such as 25, 50 and other "even" values, do not appear. However, such values in themselves usually have no particular significance; they are simply convenient numbers to remember. Where no tolerance is specified it is to be understood that the largest tolerance available in that value is to be used; where two or three tolerances are available and a small tolerance is required, it will be specified. For example, if a 47,000 ohm resistor is called for, the tolerance is understood to be 20% unless otherwise specified. On the other hand the 36 value appears only in the 5% column, so it would be understood that a 3,600 ohm unit would have 5% tolerance.

Values for the capacitances of small mica condensers follow a similar table, although in this case values listed under 5% tolerance can also be obtained with 2% tolerance.—June 1946 "QST."

TABLE 1

20% Tolerance	10% Tolerance	5% Tolerance
10	10	10
		11
	12	12
		13
15	15	15
		16
	18	18
		20
22	22	22
		24
	27	27
		30
33	33	33
		36
	39	39
		43
47	47	47
		51
	56	56
		62
68	68	68
		75
	82	82
		91
100	100	100

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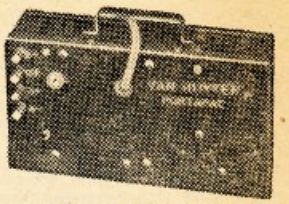

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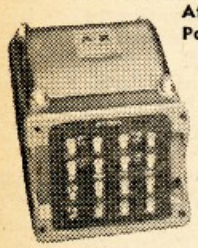

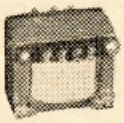

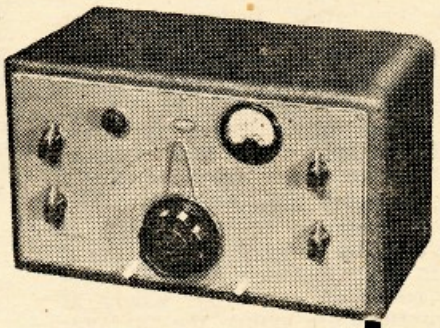

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Variable Frequency Crystal Control

BY J. G. REED*, M.I.E. (Aust.), VK2JR

This article is based on a paper read before the Wireless Institute of Australia, N.S.W. Division.

The increasing congestion in Amateur communication bands of 80, 40, and 20 metres takes considerable pleasure out of contacts particularly when local QRM assumes blanketing proportions. Under such conditions operation with orthodox crystal control is akin to an eandeavour to drive down a crowded highway with a fixed steering wheel. After numerous bumps with others like afflicted, the less hardy draw into the figurative curb and wait until traffic thins down a little. If such a state of affairs existed in the motoring world none would tolerate such bedlam. Amateur Radio traffic labours under interference equally as annoying, seeking a doubtful relief by crystal change which is often "out of the frying pan into the fire."

Variable frequency valve oscillators afford some form of relief, but if not skillfully constructed and operated, signals are likely to flounder about the band.

It has been long known that it is possible to cause slight shift in the frequency of a crystal oscillator by connecting a small variable capacitor between the grid and cathode. All broadcast stations employ this connection in their frequency control circuits for precision adjustment to their assigned channel frequencies.

Frequency change of one or two hundred cycles per megacycle is possible by this means. Expressed in frequency change on the 40 metre band, this would be little more than a kilocycle, and be by no means adequate in steering past the beat note of an interfering station.

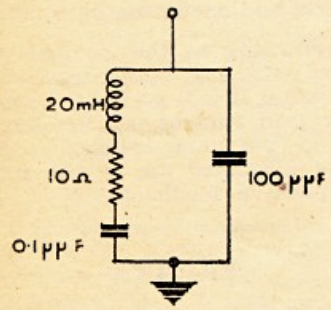


Fig. 1.—Equivalent circuit of 3.5 Mc. Crystal.

During the war years it was found that serious mutual interference occurred between stations occupying narrow communication bands. Investigation of methods of crystal control revealed the fact that it was possible by relatively simply means to secure controllable frequency shifts of at least one kilocycle per megacycle, and with some crystals, free of spurious modes of oscillation, changes of two kilocycles per megacycle were obtainable.

Taking the conservative figure of one kilocycle per megacycle, this would give a "steerability" of seven kilocycles on the 40 metre band, fourteen kilocycles on the 20 metre band, and as much as twenty-eight kilocycles on 10 metres. With such a flexible control of operating frequency, it would seem that the experimenter's perennial dream of a rubber crystal has at last come true.

Referring to Fig. 1 it will be seen that the equivalent circuit of a typical "AT" cut crystal is a network of two arms; that to the left corresponding approximately to that of the actual distributed capacity of holder, associated crystal, and the right arm that of the valve and socket and other circuit strays paralleled to the crystal.

Reactance Neutralising of Crystal Circuit.

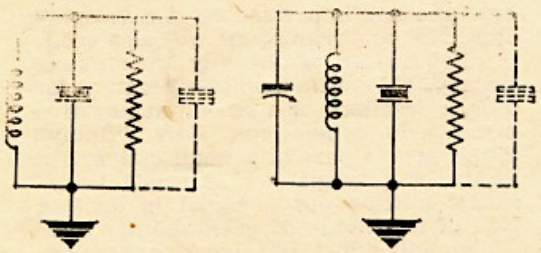


Fig. 2a. Inductor Control.

Fig. 2b. Capacitor Control.

Adding capacity in parallel to the Co. element will cause a slight decrease in frequency as mentioned above. If this capacity could be reduced the frequency would be increased above normal. Little can be done as regards the actual physical reduction in capacity in the crystal circuit. However, it is possible to neutralise the negative, or capacitive reactance by the addition of positive or inductive reactance in parallel to the crystal holder.

Fig. 2 illustrates two methods of accomplishing this reduction in capacitive reactance of the crystal circuit. Use of a directly variable inductance presents mechanical complications as a suitable proportioned variometer is not a standard item. The alternative circuit in Fig. 2b employs a capacitor tuned "LC" circuit paralleled to the crystal. The latter circuit must tune—with the distributed capacity—to a higher frequency than the normal frequency of the crystal, gradually approaching resonance as the value of the variable capacity is increased. (In the inductance tuned circuit of Fig. 2a the tuning should approach from the low frequency side.)

Full neutralisation of the shunt capacity should not be attempted, particularly with "AT" cut crystals, otherwise operation on spurious frequencies may occur. "X" cut crystals are relatively free from spurious response, and may be operated with the capacity reactance neutralising circuit much closer to crystal frequency resonance with corresponding greater frequency shift.

Care should be taken in the mechanical construction of both capacitor and inductor employed in the frequency shifting circuit. Ceramic former for the inductor and similar endplates for the capacitor will ensure high stability.

Compared with the frequency stability obtainable in a simple tuned circuit oscillator employing a similar inductor and capacitor, the stability of the variable frequency crystal oscillator is better than fifty times that of the oscillator for corresponding small changes in L or C values of the tuning circuit.

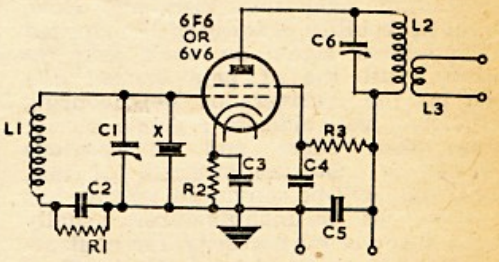


Fig. 3.—Circuit for Variable Frequency Crystal Oscillator.

C1—50 to 100 pF. Variable.
C2, C3, C4, C5—0.01 uF.
R1—100,000 ohms.
R2—400 ohms.
R3—10,000 ohms.
C6—100 pF. Variable.
L1—20 uH. Inductance.
L2—30 uH. Inductance.
X—3.5 Mc. Crystal.

A suitable circuit for operation under variable frequency crystal control is given in Fig. 3. A tetrode or pentode valve should always be employed for a crystal oscillator. The low capacity between grid and anode of such valves keeps the Miller capacity effect low. As this dynamic reflection of capacity appears in parallel with the crystal it has an influence on the generated frequency which would be relatively important in the special circuit described in this article.

Crystal oscillators should be employed for frequency stabilisation and not be depended on as power generators. Valves are relatively cheap, and it is recommended that the crystal oscillator be followed by an amplifier inductively

(Continued on Page 17)

* 57 Kameruka Rd., Northbridge, N.S.W.

Neutralising that Tetrode P.A.

BY J. N. WALKER* (G5JU)

The subject of instability in beam tetrode r.f. power amplifiers has been flogged to such a degree that one would think no more need be said about it. One has only to listen on the Amateur Bands, however, to realise that the importance of the point is not yet fully appreciated by many Amateurs, who still unwittingly emit signals other than, and in addition to, the fundamental one.

It is not the intention to discuss parasitic oscillations of the v.h.f. and low radio frequency types. Suffice to say that tests should always be made, when setting up a new transmitter, to ascertain if parasitics are present and, if any signs of them are found, steps taken to eliminate the parasitics, using methods which are common knowledge.

CAUSE To make our present point, let us assume a transmitter with a p.a. stage using an unneutralised beam tetrode (or perhaps two in parallel or push-pull) of the 813, 807 or KT8, etc. variety, the bias being partly or wholly fixed so that, when not driven, the anode current is zero.

Switch on the transmitter and adjust for normal excitation, load, etc. Now, in all probability, a study of the emitted unmodulated signal on one's own receiver (with the r.f. gain backed off) and on the receivers of neighbouring Amateurs, will indicate a single carrier with clean edges and no spurious "squiggles." On the strength of this, the owner will be convinced that he has and that, as the manufacturers usually state, there is no necessity for neutralisation. All well and good. Or is it?

To make quite sure, try this test. Without touching any tuning controls, "kill" the drive by any convenient method but leaving normal voltages applied to the electrodes of the p.a. valve. Or rather, if high voltages are in use, it may be wiser to reduce at least the anode voltage to something like 60% of normal.

Next, gradually reduce the grid bias voltage (care being taken to see that the operator does not come in contact with any h.t.). Soon after a standing anode current is registered on the anode current meter, it is only too likely that the current will jump suddenly to a comparatively high value and grid current will also be indicated. The stage has, in fact, gone into self-oscillation.

Again, look for the signal on your receiver. The text book will tell you that, because of the altered operating conditions, particularly as regards phase, the tuned plate tuned grid circuit we are in fact considering will oscillate at a slightly different frequency when self-excited than when it is driven. Your receiver will confirm this fact. On the 14 Mc. band, for example, the difference may amount to 500 Kc. or even more, and the new frequency may lie outside the Amateur Band.

EFFECT Now to the point. If the feedback is sufficient to allow self-oscillation to occur, the transmitter may be operating under what amounts to a "locked" condition. For a fraction of a second when the drive is applied, the p.a. self-oscillates but very rapidly comes into lock with the drive frequency.

There are two important effects when this happens. One is the interference caused by the actual sweep of 500 Kc. or so across the band (keeping to the 14 Mc. example). The other is that a transient of this nature in itself creates sub-harmonics over a wide frequency range and interference can be caused to receivers working on frequencies well removed from the transmitter fundamental, and that over a wide area, when considerable power is employed.

Obviously, this effect will occur every time the key is pressed by a c.w. operator. Not so obviously, it will also occur if the carrier is heavily modulated, through the valve being inoperative for minute fractions of a second at negative peaks. So when you hear "funny" noises at one part of a band and find a local (or perhaps not so local) transmitter putting out a signal in another part of the band—or even another band—you will appreciate what is happening. It is then up to you to see that he reads this article and also up to you to make quite sure that your own transmitter is not "playing up" in the same way.

If, when carrying out the foregoing test, self oscillation does not take place before the anode current reaches a value such that the rated dissipation is not exceeded, do not be satisfied. Try rotating the anode and grid tuning condensers (the latter may, of course, be the anode tuning condenser of the preceding stage) to ensure that the stability is high irrespective of the adjustments. If self-oscillation is experienced, it will be just as necessary to eradicate it.

THE CURE The cure, obviously, is proper neutralisation, so that the stability is actually, as well as apparently, high.

Neutralisation is carried out exactly as with a triode amplifier but the application is not so easy, by reason of the very much smaller capacity which has to be balanced out. A popular method with twin tetrode valves (of the QV04/20 or 829 types) is to run well insulated wires from the grids and permit them to lie near the opposing anodes, varying length and distance until neutralisation is correct. The writer approves (and uses) this method on the v.h.f's. as it is desirable to keep the physical mass of metal to a minimum. At the same time, it must be admitted that it is somewhat of a "hit or miss" method and becomes more difficult to apply and adjust with valves of physically greater sizes.

Some means of making a definite adjustment is desirable and the writer has found the answer in the use of a modified Eddystone Cat. No. 481 neutralising condenser (two in a push-pull stage). The modification consists of the removal of the larger of the two cups and the reversal of the metal part which holds the screw plunger so that a wider than normal gap results.

The condenser must be mounted in such a way that the two connecting wires are screened from each other—otherwise the capacities between the wires are liable to be greater than that of the condenser. It is also desirable to keep the connecting wires short, particularly at the higher frequencies. There will usually be a metal screen separating the input and output circuits and it should not be difficult to fit the condenser in a position on this screen such that it is readily accessible for adjustment and fulfils the other conditions. The fixing screw should be a countersunk type, when the possibility of flash-over is remote, even with a well-modulated 813. The circuit will take the normal form, with a split-stator tuning condenser in the anode circuit. The neutralising condenser should be adjusted in the direction which indicates a reduction of grid current, under self-oscillatory conditions, and a quite definite point will be found at which self-oscillation will not occur at any positions of the grid and anode tuning condensers.

On returning to the normal driven condition, with grid bias increased to its normal value, it will probably be noticed that the grid current is little less than it was in the unneutralised condition, which is accounted for by the removal of the positive feedback.

* Engineer, Technical Services Depart., Stratton & Co. Ltd., Birmingham, Eng., and published by special arrangement with the "Short Wave" Magazine.

ERRATA

It is regretted that an error appeared in the drawing of Fig. 2 on page 16 of the November 1948 issue. There should be no connection between the moving arm on upper section of S1 and position A on lower section of S1 as this obviously shorts out R1 on Range A.

Also in the schematic on page 18 of the same issue two C23s appear. The output coupling condenser should be C24 and of a capacity of 100 pF. The filament by-pass condenser (C23) near T1 is a 0.006 uF mica. We suggest you make the above alterations to your copy.

IONOSPHERIC PREDICTIONS FOR THE AMATEUR BANDS

The charts accompanying this page, prepared by the Ionospheric Prediction Service of the Commonwealth Observatory, are similar to the first set published in the November, 1948, issue of this magazine. Nine of the charts, prefixed by the letter "C" for Canberra, refer to forecasts for the South-Eastern Australian States. The remainder, prefixed by the letter "P" for Perth, are for Western Australia.

The Canberra charts refer to the following world zones:—

Zone	Region	Terminal
1	Western Europe	London
2	Mediterranean	Cairo
3	N.-West America	San Franciso
3a	N.-East America	New York
4	Central America	Barbados
5	South Africa	Johannesburg
6	Far East	Manila

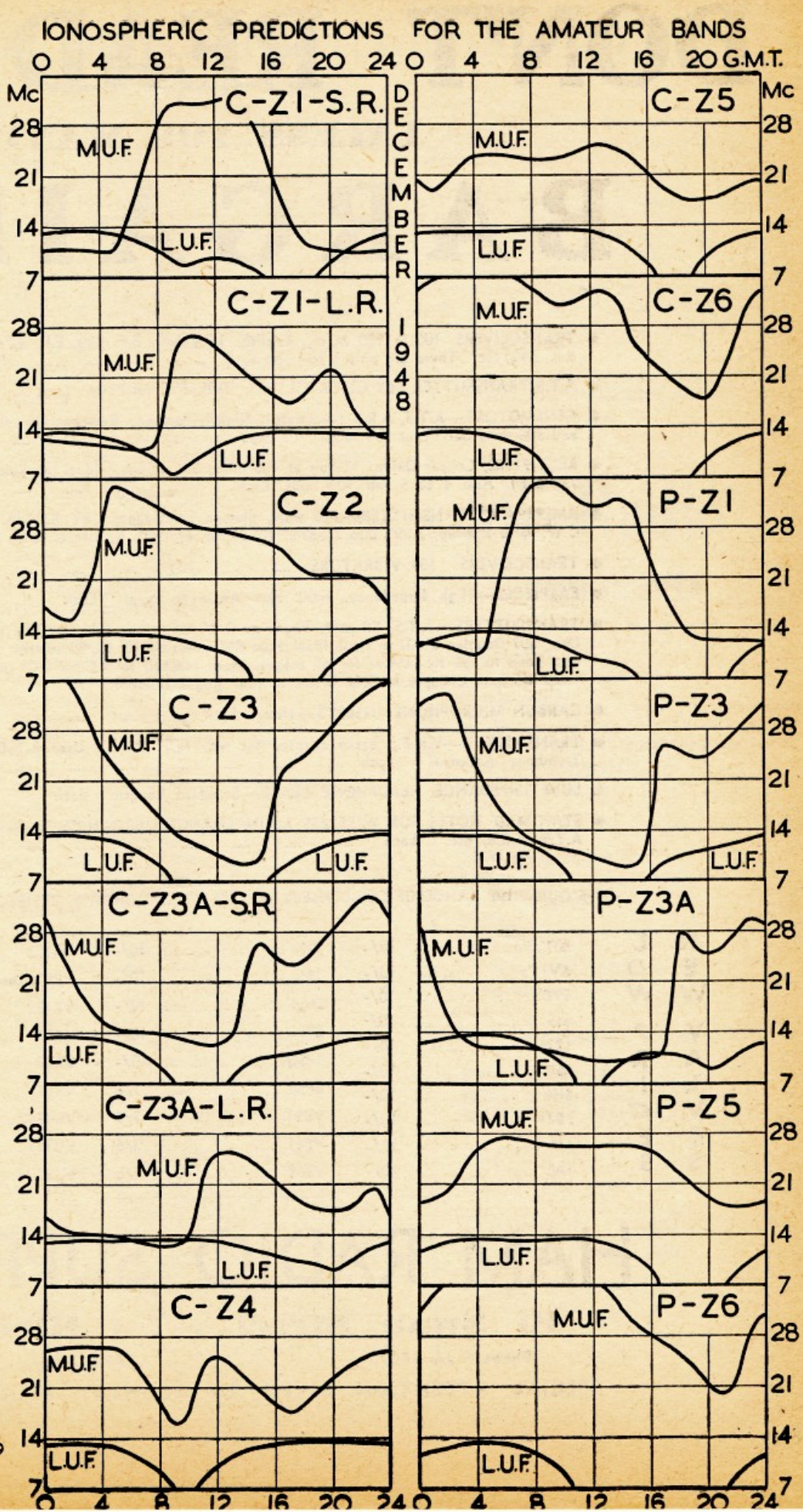
The forecasts have actually been prepared for point-to-point circuits between Canberra and the overseas terminals mentioned in the above table. It is, however, to be expected that the charts will provide an approximate indication of ionospheric conditions for all Amateur contacts from South-Eastern Australia to the various world zones.

The Perth charts are similar to those based on Canberra, except that the Far East terminal is Shanghai in chart P-Z6. No forecasts are given from Perth for Zones Z2 and Z4 for the current month. Chart P-Z2 would be essentially similar to P-Z1, while chart P-Z4 would be unreliable due to auroral activity in high northern latitudes.

USE OF THE CHARTS

All that is necessary in using the charts is to select a time (G.M.T.) during which a specified Amateur band frequency is below the maximum frequency (m.u.f.) of the F region of the ionosphere but above the lowest useful frequency (l.u.f.) for the desired contact. In two cases, Zones 1 and 3a, it is necessary to consult both the short-route (s.r.) chart and the following long-route (l.r.) chart.

A practical example might be that of a contact desired between Melbourne and Manchester. The relevant charts are C-Z1-SR and C-Z1-LR. The 28 Mc. band should be open for a few hours both before and after noon G.M.T. on the short route. The 14 Mc. band should be available from sunrise to sunset in England with best conditions on short route towards the end of the English day, when the l.u.f. drops below 7 Mc. Best conditions on long route in the 14 Mc. band should be at about 0900 hours G.M.T. when the whole of the long route is in darkness. The only possibility of a contact in the 7 Mc. band is on short route during the English sunset period at which time there is a complete dark path over the Indian Ocean.



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Modulating the SCR211 Frequency Meter

BY F. T. HINE*, VK2QL

How many of us have often wished we had a modulated output from the SCR211 for lining up receivers in the number of ways an Amateur requires. I know I frequently did, and eventually decided the job must be done, and to my surprise it worked out all so simply.

The first requirement is an audio oscillator without a built in supply, although the built in supply can be used. Other parts required are one double pole single throw toggle switch, one banana-type plug and socket, and two 0.01 uF. mica condensers.

The audio frequency can be adjusted to the individual taste when the audio oscillator is being constructed. This oscillator should be constructed to fit in the compartment which was normally occupied by the batteries.

My instrument was the "N" model, for which I have an external voltage regulated power supply delivering 105 volts, so the main details will apply to this particular arrangement, but, basically, it will work out for most models.

One thing that must be kept in mind is the fact that you must be able to remove the instrument from its case as before.

First, remove the meter from the case, and remove the insulated strip holding both the plug and socket used for connecting supply voltages to the instrument, leaving ALL wiring in place. You now need a piece of insulating material the same thickness and width, but approximately 1" longer to replace these in both cases. Drill the new pieces, using those removed as the template, to correspond to those removed. Now take the extra plug and socket, and, at the end of each strip above the top securing screw hole, drill the hole to take the plug and socket respectively.

Assemble these strips, complete with solder lug and about 18" of wire attached to the new plug and socket. This has now given you the means of coupling the audio from the power supply compartment to the instrument itself.

The lead from the plug to the instrument, in my model, now is fed through a ready-made hole directly under the strip.

Connect one of the 0.01 uF. condensers to the h.t. side of the voltage dropping resistor of the oscillator valve. In the various models this resistor is known as: model A, R26; D, R21-2; B, R17; Q, R16; M. O. R. and AC, R19; AA, AE, AG, E and N, R18; P, T, AF, AH, R21; all of 50,000 ohms.

This condenser, although doing the duties of coupling, is also keeping the high tension from being anywhere but at the junction of the condenser and the 50,000 ohm resistor in respect of this modification. Now connect the other end of the condenser to the lead from the plug just fitted. This completes all action in respect of the meter itself.

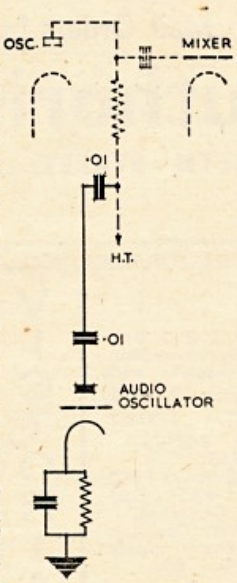
The lead from the newly fitted socket is fed through the hole already used to get the power leads from the battery compartment to the insulated strip.

The model "N" has a narrow compartment in the front of the meter case at the bottom lower half. Remove the cover from this compartment and a dividing partition will be seen between the battery compartment and the spares compartment. In this partition drill a hole to take and mount the toggle switch.

This switch is now placed in the lead from the main filament and h.t. supply to the filament and h.t. of the audio oscillator.

If you are going to use the audio oscillator to some great extent there is no need to break the filament voltage, but the average Amateur will use the modulated section considerably less than the r.f. section so why run the filament all the time.

Now connect the second 0.01 uF. condenser to the anode of the audio oscillator tube. This condenser also prevents h.t. from proceeding past the tube anode as well as doing the job of coupling, so that no h.t. occurs anywhere in the coupling circuit between the audio oscillator anode coupling condenser.



Dotted lines indicate existing frequency meter wiring. Full lines new installation.

This completes the modification. With the modulation switch "off," switch on the frequency meter. Check some of your crystal check points and you should see absolutely no change from previously.

Switch on the audio oscillator and you should hear the modulation come on after the tube has warmed up. This will NOT be tunable in the earphones you have plugged into the frequency meter. Remove the earphones or speaker, if you use one (mine is an earphone mounted in a cigar box), and replace with a plug which has no external connections. This will enable you to operate the meter without listening to the meter itself. Switch on your t.r.f. or AR88 and set the tuning to the beat of the frequency meter and receiver. Now switch off the b.f.o. switch on the receiver and switch on the audio oscillator. As soon as it warms up you will hear music in your ears to the tune of audio frequency you built into the audio oscillator.

An added refinement can be made by putting a 5,000 ohm potentiometer in the h.t. lead to the audio oscillator. This will give you a variation in tone and this control can be placed on the same panel as the "on/off" switch for the modulation, although in our particular case we have found it unnecessary.

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A Turning Indicator for Rotary Beams

BY P. M. JEFFERY*, VK6PJ

While discussing turning indicators with G2IG he mentioned a system used in England in which I became rather interested.

Briefly, the system consists of a continuous circular rheostat of suitable value tapped at each 120°. Two sliders insulated from one another are placed at opposite ends of a diameter arm. This arm is pivoted in the centre and is connected to the beam. The two sliders are connected to a d.c. source of any suitable voltage available (11 volts in my case). The three tappings are now connected to the shack and into the indicator.

Inside the shack the indicator consists of three coils at 120° to one another connected in a "star" circuit. In the centre of this star is a small magnet pivoted at the centre. This magnet has a pointer attached and takes up a single unique position for each position of the slider arm at the beam.

Does this sound difficult to construct? Yes!

However faced with the excessive cost of Selsyn indicators the author produced the following solution.

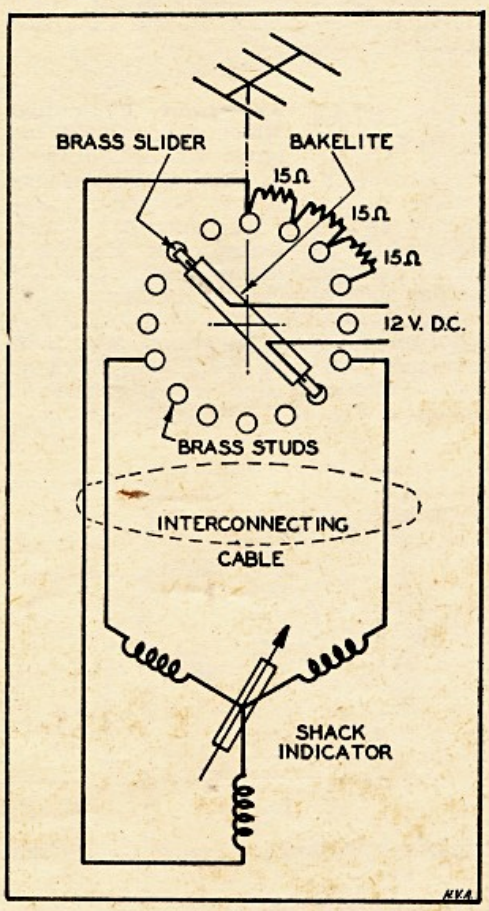
Being lazy, I did not feel inclined to wind a rheostat (225 ohms in my case) so as an alternative I mounted 15 brass studs in a circle and joined each with a 15 ohm resistor. This gives 15 indicated directions only and is not as good as a continuous winding, but what a saving of energy! The slider was made from bits of bakelite and brass.

The real problem was the shack indicator, but this turned out to be easier than the rheostat.

An old aircraft indicator was obtained and modified. (I think these indicators were glide path indicators. They have degrees marked on the face starting at zero from the top and a red and green light on either side at the bottom.) To modify the instrument remove the glass face and pull off the indicating needle (straight pull only). Get inside the "works" taking care not to break the thin shaft that drives the pointer.

Remove the rotating magnet and carefully cut or break off the fixed magnet. Replace the rotating magnet and reassemble. Two small screws, one on top of the other, will be found at the back of the case. The first one of these is a locking screw and should first be removed, then the underneath screw adjusted for smooth rotation of the needle shaft and the lock screw replaced. Connections are then made to terminals 1, 2, and 3 at the back.

Using 11 volts d.c. I have found the indicator most satisfactory. In my case a four-core cable (lead covered return) is used to inter-connect the two units and a further refinement has been added. My beam is not of the continuous rotation type, so I wired two additional studs and a contact to the red and green lights in the shack indicator. One side of the beam reversing switch is painted red and the other green. I simply press the switch towards the colour indicated and the beam reverses in the correct direction.



The cost may be of interest to some impoverished Hams. Shack indicator, 5/-; 15 15-ohm resistors, 8/-; brass screws, etc., 2/-. Total of 15/- excluding the inter-connecting wire which in my case came to more than the indicator (18/- for 70 feet).

Most Ham shacks have a d.c. voltage of suitable magnitude and little difficulty should be experienced in this direction as no regulation is needed.

THE EDITOR AND STAFF
WISH ALL AMATEURS
A MERRY CHRISTMAS AND
A HAPPY NEW YEAR

* 35 Park Road, Mt. Lawley, W. Aust.

HANDY RESISTOR WATTAGE TABLE

In modern receiver and transmitter construction much space can be saved by using carbon resistors of less than 1 watt ratings, because there is no point in using a 1 watt resistor where a ¼ watt would be satisfactory, such as in an a.v.c. line for instance.

As a guide to the maximum current which can be carried by a 1 watt, ½ watt, and ¼ watt, the following table is appended.

It will be noticed that a 50 ohm resistor of 1 watt rating will carry 140 Ma., and if the current is reduced by half to 70 Ma., the wattage required is reduced to a quarter watt with a big saving in the space taken by the resistor.

Resistance in Ohms	1 Watt	½ Watt	¼ Watt
50	140 Ma.	100 Ma.	70 Ma.
100	100 „	70 „	50 „
200	70 „	50 „	35 „
300	57 „	41 „	28 „
400	50 „	35 „	25 „
500	44 „	32 „	22 „
600	41 „	29 „	21 „
700	38 „	26 „	19 „
800	35 „	25 „	17 „
900	33 „	23 „	16 „
1,000	31 „	22 „	15 „
1,500	26 „	18 „	13 „
2,000	22 „	16 „	11 „
5,000	14 „	10 „	7 „
10,000	10 „	7 „	5 „
25,000	6 „	4 „	3 „
50,000	4 „	3 „	2 „
100,000	3 „	2 „	1.5 „
500,000	1.4 „	1 „	0.7 „
1 Meg.	1 „	0.7 „	0.5 „

Formula: $I = \sqrt[2]{\frac{W}{R}}$

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Revamping Power Transformers

BY J. A. GAZARD*

Very often when planning the construction of Amateur gear it is found that the filament or power transformer on hand has not the required filament windings for the tubes to be used. It is, however, a relatively simple matter to alter these windings in the case of most transformers and following are some suggestions for these alterations.

Most small transformers of the broadcast receiver type have the primary winding next to the core, then over this is wound the high voltage secondary and on top of this again, on the outside, are wound the filament coils. To alter the windings it is first necessary to remove the laminations. The clamping bolts are first removed and by springing up the outside laminations it will be seen that each of these has been pushed into the core alternately from either end. It will be necessary to grip the first few laminations with the pliers to remove them, but after these are withdrawn the remainder are loose and can be easily slipped out, leaving only the windings with the terminal board attached. This board, and the outside wrapping of the coils, can then be removed; care being taken to correctly label the coil ends.

The number of turns on the outside winding, which is then exposed, can be counted and the number of turns per volt on the transformer thus found. For example if a five-volt winding is found to have 27 turns, the turns per volt are $27 \div 5 = 5.4$, and if it is required to add a four-volt winding, then it is 4×5.4, say 22 turns will be required.

When adding or rewinding, the system of the existing windings should be followed. Transformer paper should be used between each layer of the winding and each winding should be insulated from adjacent windings with a layer of tape.

A rectifier filament winding should be insulated with additional layers of tape according to the voltage to be applied to it. Cotton covered enamel wire of the following sizes is recommended for Amateur transformers:—

Current	up	to	1	amp.—	22	s.w.g.
"	"	"	2	"	20	"
"	"	"	3.5	"	18	"
"	"	"	6	"	16	"

Care must be taken that the finished size of the coils are not increased so much as to make them too large to fit the laminations. In many cases it will be possible to add one additional filament winding to the transformer without removing any existing windings. If the transformer is required only as a filament transformer then all the secondaries including the high voltage secondary can be removed and there will be ample space for a number of filament windings.

After rewinding is completed, the laminations are re-inserted in the coils and the terminal board refined. The complete job of altering a single winding should be finished in less than two hours.

TWIN BIAS SUPPLY A simple adaptation which will be of interest to Amateurs is the conversion of a receiver type transformer to a combined filament transformer and twin bias supply. In this case, after the transformer has been dismantled, the filament windings and all but 200 volts half wave of the high voltage secondary are removed. The required filament windings are then rewound and the combined filament transformer and bias set is wired as shown in Fig. 1.

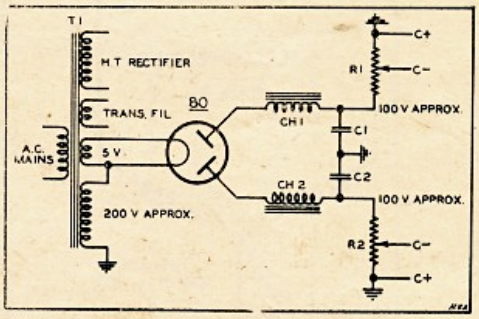

Fig. 1.

T1—Altered Power Transformer (see text).

CH1, CH2—30 Henry Filter Choke.

R1, R2—15,000 ohms Voltage Divider.
C1, C2—8 uF. Electrolytics.

The result is a filament supply plus two bias supplies for separate stages of the transmitter, the bias being applied automatically when the filaments are switched on.

The two bias supplies are virtually independent. The only common part of each circuit is the 200 volt secondary which has a low resistance (generally less than 100 ohms) and the rectifier prevents rising grid current of the output stage "backing up" the voltage to the intermediate sage.

For tubes requiring bias greater than 100 volts, which will be obtained from a 200 volt secondary with choke input, it will be necessary either to increase this winding or use condenser input.

* Member of South Australian Division.

STATION DESCRIPTION

VK4EL BRISBANE

VFO Unit.—This comprises a 6V6G osc. and 6F6G doubler, the oscillator being on 1.75 Mc. The unit is operated with AC on the heaters and 90 volts of B supply from batteries. This unit is link coupled by means of co-ax cable across to the exciter unit which is in the rack and panel. (The VFO is situated to the right of the receiver, which is directly in front of the operator.)

Exciter Unit.—This begins with a 6F6G on 7 Mc., then an 807 which is a doubler to 14 Mc. or a tripler to 21 Mc., and lastly another 807 which is a buffer on 21 Mc. or a further doubler to 28 Mc. Links are taken from the 7, 14, 21 and 28 Mc. stages and by a method of patching, are used to drive whichever final amplifier is being used and sufficient drive is obtained to drive to the full 100 watts on any final used. This exciter is link coupled to the following final amplifiers.

7 Mc. Final.—An old 45 tube is used on this band with 60 watts input. **14 Mc. Final.**—An 805 is used on this band with an input around 85-90 watts. **21 Mc. Final.**—When available an 834 will be used here with about 60 watts input. **28 Mc. Final.**—This uses at the present an old 808 which, when it is replaced, will also use an 834, however the 808 is at present also run to 60 watts.

The same power supply is used for each final and is switched to the final required; it is 600 volts at 150 mills., the exciter runs off a 400 volt pack. The final amplifiers are all link coupled to an aerial coupling unit and thence to the antenna.

Antenna System—This is a vertical 33' centre-fed job with 34' feeders about 4½" spacing; the bottom of the antenna is 8' 9" off ground. The antenna is constructed of ¾" steel furniture tubing which is mounted on a wooden pole with stand-off insulators, the feed line is 7/18 stranded copper wire.

The Receiver used is a double conversion super, home-made which uses a first conversion frequency of around 1600 Kc. and this is link coupled to the second channel which is 455 Kc. The second channel has a crystal controlled HFO to guard against any frequency drift. The first or "front end" uses 9001 R.F. and 6K8 mixer using its own oscillator, the two channels are connected by means of a low impedance co-ax line. The antenna used on the receiver is an old 66' flat top zepp about 17' high.

Telephony Arrangements.—A system of grid modulation is used here and comprises as a unit, 6SJ7, 6AC7 pre-amps., with 6V6G modulators. This feeds into the grid bias supply to the final amplifiers. NOTE.—All final stages in the transmitter are biased to Class C conditions, and on CW the last driver stage is keyed, the final is never keyed directly. Mike is a home-made velocity type.

THE UNBEATABLE, WORLD-FAMOUS EDDYSTONE 640

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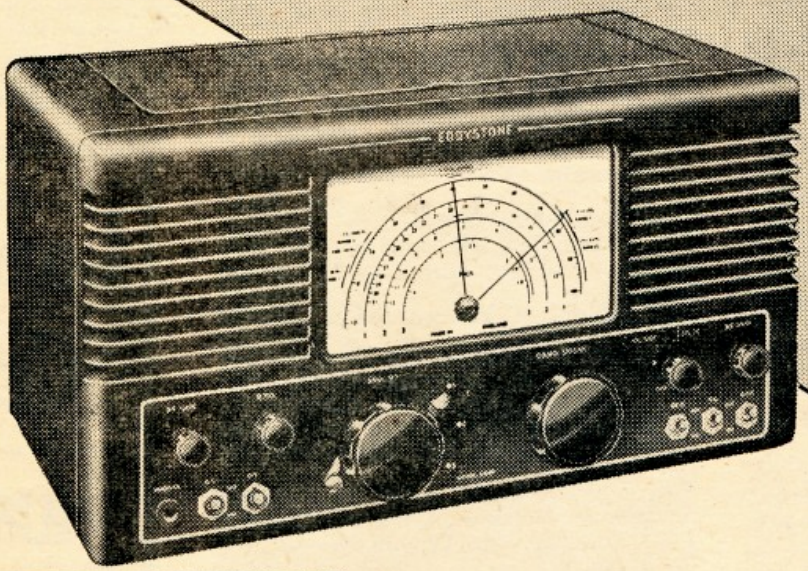

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1. Receiver has been designed primarily for Amateur Communication purposes, tuning range from 31 Mc/s to 1.7 Mc/s.
2. Designed to operate from Standard AC Mains with Inputs of 110 volts, 200/240 volts 40/60 cycles as well as from a 6 volt battery by use of a vibrator unit.
3. Inclusive all valves, the "640" is a 9-valve job with one tuned RF stage, FC, two IF stages, detector-AVC-audio, 2nd audio output, noise limiter. BFO and rectifier. The valves used, in that order are EF39, 6K8, EF39, EF39 6Q7, 6V6, EB34, and 6X5. These are all international octal based on the Mullard or Brimar versions and therefore easily replaceable.
4. TUNING RANGE— (1) 31 to 12.5 Mc/s (2) 12.5 to 5 Mc/s. (3) 5 to 1.7 Mc/s.
5. TUNING. An electrical band-spread arrangement is used for this purpose. Flywheel control is utilised on the band-spread condenser drive. The scale is clearly marked with all amateur bands, and is so arranged to enable accurate re-setting to a spot frequency.
6. I.F. FREQUENCY—1600 Kc/s.
7. CRYSTAL FILTER is vacuum mounted to provide a high degree of stability. Phasing control and "in/out" switch are brought out to the front panel.
8. Sensitivity is better than 2 microvolts input, for 50 milliwatts output, at all frequencies.
9. OUTPUT. Audio frequency output exceeds 3.5 watts.
10. "S" METER. A socket is provided for an external "S" Meter.

A substantial reduction on the overseas price of the "640" has brought the Australian price tumbling from £72 to £56/10/- (plus sales tax). Here is the grand opportunity many of you "Hams" have hoped for — the chance to obtain, at a very moderate price, the most outstanding distance-getter in the world today ! Experienced DX men agree that the 640 has a signal to noise ratio superior to anything on the world's market. Don't waste time and money attempting to modify obsolete sets — take advantage of this startling price reduction to enjoy, right from the start, the thrilling unbeatable DX performance of the 640.

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W.I.A. 1949 National Field Day Contest

GENERAL RULES

1. The Wireless Institute of Australia's National Field Day Contest will be held over the week-end of 29th and 30th January, 1949, and will commence at 1500 hours E.A.S.T. Saturday 29th and continue through until Sunday 30th at 2359 hours.

2. The Contest is limited to portable stations operating within the Commonwealth and its mandated Territories.

3. A portable station, for the purpose of the Field Day, is defined as one whose power is not obtained from either private or public mains, shall not be located closer than 5 miles to the home location of the operators, and shall not be situated in any occupied dwelling.

4. No apparatus is to be set up or erected on the site of the portable station earlier than six hours prior to the commencement of the Contest. A station may be moved from one site to another, within the same State during the period of the Contest.

5. More than one operator may be used in the operation of the portable station, providing that all operators are licenced Amateurs.

6. Operation may be on any of the recognised Amateur Bands, and more than one transmitter may be used, providing that only one transmitter is used at any one time.

7. When calling, portable stations are to use the letters "W.I.A. N.F.D." frequently to indicate that they are portable stations. Attention is directed to the requirements for portable stations in the P.M.G's. Handbook.

8. **Sections.**—The Contest is divided into three sections; namely, Open, C.W., and Phone. The Open section shall consist of both C.W. and Phone operation. Participants may enter for all sections, providing a separate log is submitted in each case.

9. **Logs.**—Logs must reach the Divisional Headquarters not later than 20th February, 1949, and decisions of the Federal Executive in all matters relating to the Contest will be final.

10. The operator(s) will choose the most convenient consecutive 24 hours of operation from the total operating time of 33 hours, and submit this 24 hours period as their log for the Field Day. Any lesser period than the 24 hours may be operated.

11. Logs must show the location of the portable, name and call signs of the operators in the party, a description of the transmitter(s), receiver(s), antenna(e), and the power supplies used for the transmitters and receivers. The power input to the final stage with the antenna connected (which must not exceed 50 watts) will also be shown in the log.

12. Log entries are to show, in the following order: date, time, station worked, Amateur band used, report sent, report received, contact points claimed, and bonus points claimed. A summary at the end of the log will facilitate checking.

13. The completed log will be signed by the operators, with a statement that the rules of the Field Day have been adhered to.

14. **Scoring.**—For the purposes of the Field Day, the following will constitute separate districts:—New South Wales (VK2), Victoria (VK3), Queensland (VK4), South Australia (VK5), Western Australia (VK6), Tasmania (VK7), Northern Territory (VK5), and Mandated Territories (VK9).

15. A complete exchange of reports is necessary before any points can be claimed.

16. Points will be awarded as follows:

(a) For contacts with a fixed station within the Commonwealth, outside the competitor's State—1 pt.
(b) For contacts with portable stations within the same State—2 pts.
(c) For contacts with stations in Asia, North America and Oceania (outside the Commonwealth)—3 pts.
(d) For contacts with stations in Europe—5 pts.
(e) For contacts with stations in Africa and South America—7 pts.
(f) For contacts with other portable stations in the Contest outside the competitor's State—10 pts.
(g) For every two-way contacts using frequency modulation, add to the above contacts 3 pts.
(h) A bonus for each Continent worked on each band, add to the final score 25 pts.
(i) A special bonus for each Interstate or Overseas contact on, or above, 50 Mc., add to the final score 50 pts.

17. **Awards.**—A suitable Certificate will be awarded to the sectional winners in each district, and to the outright winners in each section; namely, Open, Phone, and C.W. Outright winners will not be eligible for the State award.

REGRETS FROM NORFOLK ISLAND

In a letter from Noel Roberts (VK 9NR) to the Contest Committee, Noel regrets that he was unable to assist more mainland stations in the Remembrance Day Contest. He is now located at the Government Aerodrome, Norfolk Island. Following is a brief extract from his letter:—

"When first getting going on the air from over here, I stumbled in on the very last few minutes of the Remembrance Day Contest, and had the pleasure of two QSOs with VK2RA and VK2PA.

"It was tough that I only got the rig going over the last ten minutes of the Contest, as I imagine Norfolk Island would have been quite a useful contact for the chaps over on the mainland.

"Transmitter was just a 6L6 tritet on 7 Mc. running a wheezing 15 watts. Am still very seldom on the air, as we have no regular mains supply here, and have to use batteries for operating. However I am assembling together some gear which should allow me to operate more often in the near future."

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Rotatable Beams On A Windmill Tower

BY A. H. LLEWELLYN*, VK2AH

The illustration shows the 50 and 144 Mc. beams at VK2AH, which are erected upon a 30 feet steel tower and rotatable through 360° ± 20°.

The tower was obtained from Messrs. Sidney Williams & Co., windmill tower manufacturers, of Dulwich Hill, Sydney, and is a light gauge 30 feet structure. This was erected by building up from the base, a method which calls for no heavy lifting, and is also recommended by the manufacturers. This can be done quite quickly and is comparatively easy. All erection details are supplied with the tower.

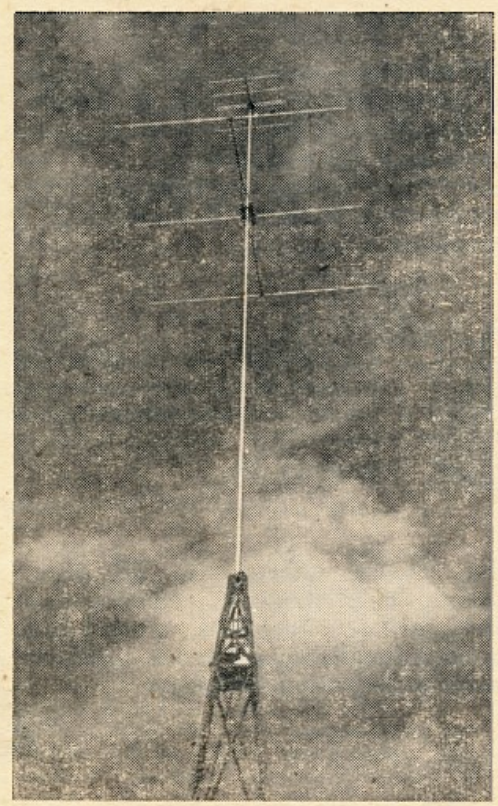
From the illustration can be seen a ¼" steel plate mounted about 3 feet from the apex of the tower with the turning mechanism and reduction gearing mounted upon it. The reduction drive, of course, depends upon the motor used and a large variety of these are available. Since the writer considers anything over 24 volts dangerous when above ground this distance "up a steel tower," an IFF motor generator was used by simply lifting the generator brushes. It was found that 12 volts will operate this and give 3½ turns per minute with good starting torque, when a gear ratio of 750 to 1 is used. With this particular motor, being rated at 18 volts, no ball-races are used because some friction is desirable to prevent oscillation due to wind. The tubing is steel conduit, screwed.

The indicator is mechanically operated and consists of a fine flexible steel cable, brought down one leg of the tower in pulleys and around a drum behind the azimuthal map and pointer, then spring loaded. This is very successful, inexpensive, and fool-proof.

When this photograph was taken no other beams were ready for erection. However, two more are being made and tested, one for 28 Mc. and one for 21 Mc. The latter being installed just above the apex of the tower.

One very interesting feature, which has proved itself, is the telescopic erection method. By simply releasing a clamp the tube comes down the inside of the tower. As each beam reaches the "apex" it is unclamped, the cable disconnected, and left straddled across the top of the tower. Since these towers are strong, two can work easily at the top and fitting the beams in this manner allows easy adjustment.

Co-axial cable is used throughout and was found to be very satisfactory. This is allowed to twist over the greatest possible length, making sure the connections do not have to "take it." Balance to unbalance transformers are used. It has been found, and proved, that "wide-spaced" beams are infinitely better for Amateur purposes when impedance matching devices suitable to these frequencies are not available. Wide-spaced antennae are broader, and do give excellent gain with some reception possible from behind, a useful feature indeed. The close-spaced arrays, if tuned to a particular crystal and carefully adjusted, will serve splendidly for transmitting on that frequency but quickly lose their characteristics "off" frequency, we have found.



Height to the 144 Mc. beam is 57', to the 51 Mc. beam 48', and to the apex of tower 33', elements are of ⅜" aluminium tubing. The elements supporting the 51 Mc. beam are of ⅝" steel, and feed with 50 and 75 ohm co-axial cable.

The antennae shown are for operation upon 145 Mc. and 51 Mc. They are highly directional and give good gain. The 145 Mc. is close-spaced at present and is used for transmitting mainly. The elements are of ⅜" aluminium tubing.

It is important to note the difference between water pipe and steel tubing. Water pipe is very heavy and made of "wrought-iron." Its own weight usually wrecks it. This tubing is not suitable unless very much over-size. Maleable steel tubing is vastly superior and can be obtained in screwed conduit very cheaply. Dural, of course, would be ideal.

The vertical tube support consists of three different size tubes telescoping into each other, of 2", 1½" and 1¼" outside diameter respectively. The 2" and 1½" diameter tubes require bushing to make them fit snugly. The diameter tubes used in this installation are inclined to sway a little, and a more rigid job can be made by using slightly larger diameter.

It is important to have very little "back-lash" in the drive, as this gives "jerky" operation. A most important point to observe is the "offset" drive feature, which leaves the hollow tube for co-axial cables. For those who have feathering motors, it is advisable to use a cycle sprocket ratio of **4 to 1** up, particularly if VHF work is contemplated seriously.

This tower will support half a ton of weight in a gale, and since the beams do not offer wind resistance comparable to an 8' diameter windmill, your chances of losing it are negligible. This one has been up two years now, and the beams subjected to high winds. Although there is considerable movement it is in perfect condition.

The cost, complete with two beams, has been surprisingly low and could not be obtained as cheaply any other way, all factors considered. It is hoped that the writer's experiences along these lines will be of benefit to others interested in a similar structure.

VARIABLE FREQUENCY CRYSTAL CONTROL

(Continued from Page 7)

coupled to the anode circuit. The latter circuit in the anode of the crystal oscillator should not be operated directly at resonance, but tuned to the high frequency side to present a positive reactance at the operating frequency. Circuit constants for operation with 80 metre crystals are given in the text accompanying Fig. 3.

With reactance modulators capable of control over a wide and linear range it should be possible to employ this form of variable frequency crystal control for experimental narrow band frequency modulation. It is an interesting prospect, and as Shakespeare says, "A consummation devoutly to be wished;" however, space limitations prevent an immediate treatment of this aspect so be patient for a while until the necessary information is prepared.

For those experimenters who have more than a "bread and butter" interest in crystal oscillator control, attention is drawn to an excellent article appearing in Volume 94, Part IIIa No. 12-1947 issue of the Journal of the Institution of Electrical Engineers dealing with "Variable Frequency Crystal Oscillators" by Stanesby and Fryer.

* 425 Blaxland Road, Ryde, N.S.W.

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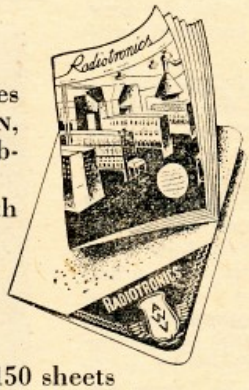

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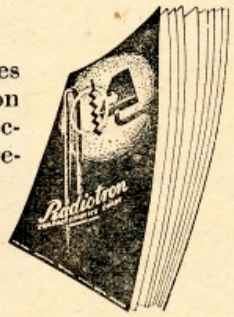

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QUESTIONS AND ANSWERS

If you have a question send it in to "Q. & A.," "Amateur Radio," Law Court Chambers, 191 Queen St., Melbourne, C.1., and if suitable it will be published in this column. If you can answer any of the published queries you are invited to send same to the above address. All such replies will be forwarded to the questioner (if he has sent a stamped addressed envelope of suitable dimensions) and also a summary printed.

A.5.—From VK3YW: G Band—190 to 210 Mc. I Band—157 to 187 Mc.

A.7.—From A.W. Valve Co.: "The gain of a sharp cut off r.f. amplifier is preferably controlled by variation of grid bias rather than screen voltage. This will result in more linear control and less cross modulation on strong input signals."

A.O.C.P. CLASS

The Victorian Division A.O.C.P. Class will commence on Thursday, 20th January, 1949. Lectures are held on Monday and Thursday evenings from 8 to 10 p.m. Persons desirous of being enrolled should communicate with the Secretary W.I.A. Victorian Division, 191 Queen Street, Melbourne (Phone FJ 6997 from 9 a.m. to 5 p.m.), or the Class Manager on either of the above evenings.

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

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Applications, referring to appointment No. 2002, should reach the Chief, Division of Radiophysics, University Grounds, City Road, Chippendale, N.S.W., by the 6th December, 1948.

BOOK REVIEWS

VALVE TECHNIQUE and V.H.F. TECHNIQUE

R.S.G.B. Publications

These two further booklets in the R.S.G.B. "Technique" series are first class. They should join Microwave Technique on your bookshelf as soon as possible.

Valve Technique "presents in as simple a manner as practicable the calculations associated with the application of thermionic valves. It is hoped thereby that the reader will find it possible to utilise the information published by the Valve Manufacturers to the best advantage. The simplified methods described are sufficiently accurate to obtain optimum results, bearing in mind the usual tolerances of component values and the normal spread of valve characteristics."

Subjects covered include voltage amplifiers, a.f. power amplifiers, r.f. power amplifiers, frequency multipliers, oscillators, detectors, frequency changers, power rectifiers, valve noise, and v.h.f. valves.

V.H.F. Technique describes the generation, propagation, and reception of frequencies between 30 and 300 Mc., and is full of information of practical interest to v.h.f. workers. Of particular interest is the information on English type valves and components and their methods of use, a lot of which is hard to find elsewhere. Quite a number of complete circuits of transmitters and receivers are given together with hints on practical construction.—A.K.H.

100 Kc. CRYSTAL FROM "LORAN" EQUIPMENT

Fig. 1 is a circuit recommended by R.C.A. for use with the 100 Kc. crystal, Type VC5. It will undoubtedly interest any Ham who purchased "Loran" equipment through Disposals channels.

The crystal has a low temperature coefficient being "DT" cut. They are pressure mounted between centrally located pins and for ordinary purposes do not need an oven. The crystal itself is silver plated to provide the two electrodes.

At 100 Kc. the peak voltage across the crystal should not exceed 100 volts or 70 volts r.m.s.—J. M. COULTER.

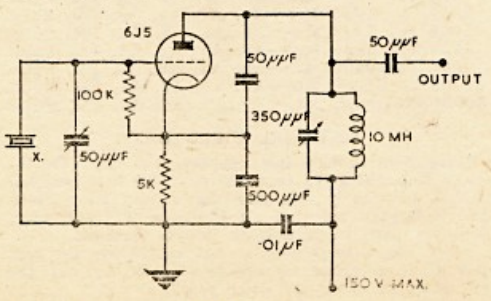

Fig. 1.

Note.—The furnishing of this information does not imply any patent license for other than Amateur or experimental use.—R.C.A.

UNWANTED RECTIFICATION

What would you do if your deaf aid started to say "Hello test, hello test, hello," with no one in the room bar yourself? The poor guy who heard it got properly windy, but as there was a Ham next door, naturally he got the blame and strangely enough, correctly. Turned out he was testing the 225 Mc. section of a No. 19 set and some rectification in the deaf aid did the rest.

Talking about ghostly voices, 3BD's XYL was startled to hear her OM's voice coming down the chimney! Tests showed that this effect only occurred when 3BD was transmitting on a certain frequency.

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FEDERAL, QSL and DIVISIONAL NOTES

Federal President.—W. R. Gronow, VK3WG; Federal Secretary.—W. T. S. Mitchell, VK3UM, Box 2611W, G.P.O., Melbourne.

NEW SOUTH WALES

Secretary.—Dick Dowe (VK2RP), Box 1734, G.P.O., Sydney.

Meeting Night.—Fourth Friday of each month at Science House, Corner Gloucester and Essex Sts., Sydney.

Divisional Sub-Editor: H. F. Treharne, VK2BM, 5 Waimea St., Burwood.

Zone Correspondents.—North Coast and Tablelands: P. A. H. Alexander, VK2PA, Hill St., Port Macquarie; **Newcastle:** E. J. Baker, VK2FP, 13 Skelton St., Hamilton, Newcastle; **Coalfields and Lakes:** H. Hawkins, VK2YL, 27 Comfort Ave., Cessnock; **Western:** G. J. Russell, VK2QA, 116 Bogan St., Nyngan; **South Coast and Tablelands:** R. H. Rayner, VK2DO, 42 Pettit St., Yass; **Southern:** E. N. Arnold, VK2OJ, 673 Forrest Hill Ave., Albury. **Western Suburbs:** A. C. Pearce, VK2AHB, 48 Harrabrook Ave., Five Docks. **Eastern Suburbs:** H. Kerr, VK2AX, No. 4 Flat, 144 Hewlett St., Bronte. **North Sydney:** L. D. Cuffe, VK2AM, 779 Military Rd., Mosman. **St. George:** J. A. Ackerman, VK2ALG, 32 Park Rd., Carlton. **South Sydney:** V. H. Wilson, VK2VW, Cr. Wilson St. and Marine Pde., Maroubra.

VICTORIA

Secretary.—C. C. Quin, VK3WQ.

Administrative Secretary.—Mrs. O. Cross, Law Court Chambers, 191 Queen St., Melbourne, C.1.

Meeting Night.—First Wednesday of each month at the Radio School, Melbourne Technical College.

Zone Correspondents.—North Western: B. R. Mann, VK3BM, Quambatook; **Western:** C. C. Waring, VK3YW, 12 Skene St., Stawell; **South Western:** B. Sectrine, VK3BI, 17a Raglan Street North, Ballarat; **North Eastern:** J. A. Miller, VK3ABG, "Erinvale," Avenel; **Far North-Western Zone:** Harry Dobbyn, VK3MF, 42 Walnut Ave., Mildura; **Eastern Zone:** J. D. Chilver, VK3DI, 20 Smith St., Leongatha.

WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

VK2WI.—Sundays, 1100 hours EST, 7196 Kc. and 2000 hours EST, 50.4 Mc. No frequency checks available from VK2WI. Intra-State working frequency, 7175 Kc.

VK3WI.—Sundays, 1130 hours EST 7196 Kc. Individual frequency checks of Amateur Stations given when VK3WI is on the air.

VK4WI.—Sundays, 0930 hours EST simultaneously on 3750 Kc., 7190 Kc., 14,342 Kc., 52.4 Mc. and 144.138 Mc. Frequency checks are given two nightly weekly, and the times are announced during Sunday broadcasts. 7010 Kc. channel is used from 1000 to 1030 hours each Sunday as VK4 query service to 4WI.

VK5WI.—Sundays, 1000 hours SAST on 7196 Kc. Frequency checks are given by VK5DW on Friday evenings on the 7 and 14 Mc. bands.

VK6WI.—Sat 2 p.m. Sun. 9.30 a.m. W.A.S.T. between 7000 kc. and 7200 kc. No frequency checks available.

VK7WI.—Second and Fourth Sundays at 1030 hours EST on 7174 Kc. No frequency checks are available.

QUEENSLAND

Secretary.—G. G. Augustesen, Box 638J, G.P.O Brisbane.

Meeting Night.—Last Friday in each month at the State Service Building, Elizabeth St., City.

Divisional Sub-Editor: F. H. Shannon, VK4SN, Minden, via Rosewood.

SOUTH AUSTRALIA

Secretary.—E. A. Barbier, VK5MD, Box 1234K, G.P.O., Adelaide.

Meeting Night.—Second Tuesday of each month at 17 Waymouth St., Adelaide.

Divisional Sub-Editor.—W. W. Parsons, VK5PS, 483 Esplanade, Henley Beach.

WESTERN AUSTRALIA

Secretary.—W. E. Coxon, VK6AG, 7 Howard St., Perth.

Meeting Place.—Padbury House, Cnr. St. George's Ter. and King St., Perth.

Meeting Night.—Watch the Monthly Bulletin.

Divisional Sub-Editor.—VK6WT, Mr. D. Couch, Mary Street, Watermans Bay, W. Australia.

TASMANIA

Secretary.—J. Brown, VK7BJ, 12 Thirza St., Newtown, Telephone: W 1328.

Meeting Night.—First Wednesday of each month at the Photographic Society's Rooms, 163 Liverpool St., Hobart.

Divisional Sub-Editor.—T. Connor, VK7CT, 385 Elizabeth St., Hobart.

Northern Correspondent.—C. P. Wright, VK7LZ, 3 Knight St., Launceston.

FEDERAL

DX C.C. LISTING

With this issue, we intend to list not only the Countries confirmed for DX C.C. but also the Zones confirmed by the members of the DX C.C. These figures have not been checked by the Awards Committee but are only included as a matter of interest. Would those members who have not already done so, please drop a line to the Federal Secretary giving total Zones worked and confirmed.

PHONE

Nil.

C.W.

	Zones	Countries
VK3CN (3)		125
VK3BZ (14)	38	118
VK3EK (10)	38	117
VK3VW (12)	39	117
VK4DA (20)	38	112
VK2EO (7)		103
VK2QL (13)		101
VK4HR (22)		100

OPEN

	Zones	Countries
VK3BZ (5)	38	143
VK3KX (1)		136
VK2DI (2)		135
VK3HG (4)		131
VK3JE (18)	39	123
VK4HR (9)		118
VK3MC (6)		117
VK6RU (11)		116
VK6KW (19)		108
VK2YL (17)		106
VK4EL (16)		104
VK2ACX (8)		100
VK2AHA (15)		100
VK2ADT (21)		100

Figures in parenthesis indicate membership number to DX C.C.

NARROW BAND FREQUENCY MODULATION

It would be appreciated by F.E. if anyone having written or practical proof of the b.c.i.-limiting capabilities of this system would send same to the Federal Secretary at the earliest.

SILENT KEYS

Arthur J. E. Shields, VK3GP, died in October at the Repatriation Hospital, Heidelberg, Victoria, after a long illness. Born in England, he served during the 1914-18 War in the A.I.F. He was on the air from 1930 to 1939 and was very active on phone and c.w. on 7 and 14 Mc. Owing to lack of a suitable QTH and, in the latter stages, illness, he was not active post-war. A likeable personality, we regret his passing.

FREQUENCY ALLOCATIONS

Listed below are the frequencies at present available for Australian Amateurs, and also types of emission that may be used:—

3.5 to	3.8 Mc.—A1, A3.	
7.0 to	7.2 Mc.—A1, A3.	
14.0 to	14.4 Mc.—A1, A3.	
26.96 to	27.23 Mc.—A1, A3, FM.	
28.0 to	30.0 Mc.—A1, A3.	
50.0 to	54.0 Mc.—A1, A2, A3, FM.	
144 to	148 Mc.—A0 A1, A2, A3, FM, Pulse.	
288 to	296 Mc.—A0, A1, A2, A3, FM, Pulse.	
576 to	585 Mc.—A0, A1, A2, A3, FM, Pulse.	
1345 to	1425 Mc.—A0, A1, A2, A3, FM, Pulse.	
2300 to	2450 Mc.—A0, A1, A2, A3, FM, Pulse.	
5650 to	5850 Mc.—A0, A1, A2, A3, FM, Pulse.	
10000 to	10500 Mc.—A0, A1, A2, A3, FM, Pulse.	
21000 to	22000 Mc.—A0, A1, A2, A3, FM, Pulse.	
30000 and higher	Mc.—A0, A1, A2, A3, FM, Pulse.	

NATIONAL FIELD DAY

Elsewhere in this issue appears the rules for the 1949 National Field Day Contest. The first post-war N.F.D. held early this year was a very poor effort, and it is expected that all Divisions will encourage their members to participate in this Contest.

This was a very popular Contest before the war and gives everyone an opportunity to try out the efficiency of their portable gear.

The v.h.f. gang are catered for so that this Contest applies equally well to allcomers. If you read last month's Editorial and want to try that rig, come out to the N.F.D. on the 29th and 30th January and help make this Contest a success. See you at the N.F.D.!!

1949 FEDERAL CONVENTION

The 1949 Federal Convention will be held sometime in April in the New Year, and as the Divisions are now collecting together matter for the Agenda, this is your opportunity to have your say. Don't hesitate to bring to the notice of your Council any matter that you consider needs attention at the Convention—do it now.

It is only by your individual interest in the administration of the Institute and its affairs that Conventions are useful and fruitful. Your problem is our problem so tell us about it.

COMMERCIAL STATION INTERFERENCE

It cannot be stressed too often the interference that is being caused by commercial stations operating in our limited bands. Part of our Editorial last month devoted space to this subject, but don't let the matter rest there—be actively interested enough to report any such off-frequency commercials as you may hear in our bands.

We must have the necessary reports before we can take the matter to the proper authorities, so write that letter now to your Council or the Federal Secretary.

F.I.A.T.S.

As previously mentioned, comments are invited on the Ionospheric charts that appeared for the first time last month. Your comments and confirmation of the predictions given will be of great assistance to Dr. Green to whom we are indebted for this service.

FEDERAL QSL BUREAU

RAY JONES, VK3RJ, MANAGER

MP4AB is the new call sign of VS9GT. He is still at Trucial Oman, with address: R.A.F. Station, Sharjah, Persian Gulf.

An extremely ornamental and artistic card is that of ZS5DZ, Elizabeth Jordan, of Pietermaritzburg, South Africa. "Bee," as she gives her personal sign, decorates the blank spaces on her card with hand paintings of local flora, making the finished card extremely attractive.

A national society has been formed in Yugoslavia. All communications and cards for YU or YT Hams should be forwarded to the address of the Society which is Postbox 180, Ljubljana.

Mike Boyce, G2CMR, of Manchester, Lancashire, England, writes giving a description of his antenna

system and requests publication of the details as he says many VKs have requested same. There appears to be nothing new or ingenious about his antenna system which is a standard unfolded dipole fed in the centre with 40 feet of 300 ohm ribbon feeder. Apparently any outstanding success Mike has obtained on 14 Mc. with the antenna is due to his location. Legs of the dipole are 33 feet.

The A.R.R.L. again points out via the I.A.R.U. that a private enterprise calling itself the American QSL Bureau, with a Newark, New Jersey, address, has no connection whatsoever with the A.R.R.L. and that all QSLs for United States and Canadian Amateurs should be sent via the A.R.R.L. QSL Bureau. To route them in any other way may result in unnecessary delay and will require duplication of effort on the part of W/VE Amateurs in receiving their cards. Full addresses of the W/VE district QSL Managers appears in every alternate issue of "QST."

Due to the irregularity and delay on surface mails between Australia and U.S.A., the volume of cards has been greatly reduced during September and October. Surface mails between the countries mentioned are taking from two to three months to reach their destinations. Obviously the period of reduced activity is only of a temporary nature and a great deal of congestion will occur when these mails ultimately arrive.

Another ornate card is that of George Chandler, J4AFA ex-VK3AC. George is returning to Australia in November and desires all wall-paper for J4AFA to be sent to the QTH of VK3AC.

Anyone who worked EA3YR will probably get a confirmation from EA3BV. Due to some skulduggery regarding licenses, Ferrando is using many differing call signs. He desires all QSLs to be sent direct only to 323 Diagonal, Barcelona, Spain.

Glad to hear news from old friend Jack Elliott, ZL3OC, who has been on the retired list for the past four years and enjoying it immensely.

Dan Wilkinson, ZL2AB, well known to VKs recently celebrated his silver jubilee in Ham Radio. Dan has been a power in the Ham land during the quarter century of activity. His jubilee was celebrated in a fitting manner as an account in "Break In" will attest.

Best wishes to all for 1948 and for a peaceful, prosperous and happy 1949 is my closing wish for this year.

NEW SOUTH WALES

A full meeting of the Division enjoyed the bright and instructive lecturette on "Automatic Transmitter/Receiver Control" given by Mr. R. A. Priddle (VK2RA) in Science House on the 22nd of October, 1948. Mr. Priddle dealt with a subject that was of great importance to Hams generally and we join him in the hope that his lecturette would result in better control of transmitters and greater comfort for all concerned. Such eminently practical talks as these are extremely valuable to the rank and file and are always very welcome.

The remainder of the meeting was thrown open to members to "air their grievances" or make suggestions for the good of members and the Ham fraternity in general. A three minute limit was put on speeches and the result was a very animated discussion that was appreciated by all.

Mr. Clive Hutcheson VK2YP was appointed Social Officer to the Council and has already booked a hall for a social evening on the 3rd of December.

Mr. Wal Nye VK2XU found it necessary to resign from the position of Secretary for business reasons and his resignation was accepted with sincere regret as he has been a tower of strength to the Council. Mr. Dick Dowe VK2RP is the new Secretary.

WESTERN SUBURBS ACTIVITIES

2AHU lost a good mast in a recent breeze, busy with cement at present, but will be back on 20 at any time. 2DW putting a fine signal out on 14 Mc. these days, works his quota of DX under most conditions. Now has modulator troubles beaten. 2QC heard frequently chasing the DX on 14 Mc., doing a good job. 2ALO another 20 metre addict. Has had a lot of experience with various types of beams. 2JT, despite his interest in c.w., Charlie is to be heard on 20 metre phone now and then. Is worried by bad electrical QRN from local neons. 2KA, a recent addition to the ranks here, is an ex-G recently settled here; may be heard from Strathfield soon. 2OQ would like to erect his beam, but owing to cramped location must make the best of a bad job, but his rig does a fine job despite the location. 2IC another who is getting his share of the good stuff, has a 2 element beam on the job. 2PX operates frequently in the early a.m. on 20 metre band, works the G boys like nobody's business. 2MH works 28 Mc. exclusively, new beam proving a great success by all reports.

2AGU is temporarily located at Taree and has been heard on 7 Mc. That burnt spot on the 20 metre band is now being given rest and treatment. 2SW puts out good quality phone on 40, keep it up Stan 2CL heard testing on 7 Mc. phone while waiting for the DX to appear. 2TD has plans for mobile marine operation; one sailor who will QSL. 2AHB worked CX6AK and VQ8AY on 7 Mc. c.w. Can't wait for the 11 year cycle peak. 2WB works them one after another on 20 metre phone. 2GR is a dyed in the wool Ham and enthusiastic as ever, currently operates on 20. 2NM has been achieving good results with 144 Mc. mobile using an SCR522. 2BF now has his quadruple conversion super on the bench, good luck Alan!

In this zone we have the Experimental Radio Society of N.S.W. which meets in Greenwood Hall, Liverpool Road, Enfield. It has some 80 members, most of whom are active Amateurs, and conducts regular meetings at the above address on alternate Thursdays. The meeting nights for December being on the 9th and 23rd of the month, while the dates for January are the 6th and 20th. New club rooms have been recently acquired, and transmitters, which will be operated under the club call of VK2LR, are being installed to enable operation on, firstly 7 and 50 Mc., and later on other bands. Regular lectures and discussions are a feature of the meetings to which prospective members and visitors are assured of a warm welcome. Future activities are being planned, a year full of interest being assured to members.

EASTERN SUBURBS ZONE

2FJ building gear for 14 Mc. and hopes for the best from his poor location. 2AHQ has finished his re-build 100 watt phone/c.w., built very small to fit his flat. 2KT and XYL 2CL active on 20 metre phone. 2ALW still using indoor antenna, and able to work a little DX. 2BC very keen on new antenna and c.r.o. 2MB busy building gear for Waverley Club 2BV; rig should soon be on the air. 2AJG QRT for a week, confined to sick bed, OK again and pounding brass. 2SA not heard for three months. Did the phone blow up on you o.m.? 2DV has t.b. class B mod. and 813 p.a. 2CF interested in recordings, not heard much on the air. 2KH heard testing mod. transformer.

2MY reports hearing pirate using the call 2PB, these signals come somewhere from Eastern Suburbs, any information would be appreciated. 2HH active again on 20 metre phone. 2CE active on 10 and 20 metre phone.

Suggested by party that Eastern Suburbs Hams have a get-together prior to Xmas, if interested please phone Dave Evans FW 4148. There are 63 licensed Hams in this zone, less than half of them being active, your scribe finds it hard to get around these chaps. I would be pleased to hear from the chaps in Randwick, Rose Bay, Dover Heights. I'm sure you fellows have quite a lot of dope. Ring FW 7053 or look for 2AX on 7 Mc.

NORTH SYDNEY ZONE

By the time these notes appear in print, it will be about high time to wish all you DX kings, v.h.f. mystics, and plain natterers in this good old world of Amateur Radio, all the best in the way of a Merry Xmas and a Bright and Happy New Year. I guess most of us will have the bogey of another war hanging over our shoulders for a while yet, but by the same token it's a darn pity that some of the people who make this world's politics aren't Hams. We make more friends in countries all over the world, probably than anyone else, and it isn't hard, is it?

2SB is among us again, having rebuilt the rig with somewhat increased power, and is battling along on 20. 2IT feeling fine as a result of getting his AR7 perking at last, and is now dragging them in on 20—at least the receiver is, but he didn't say if he was working them! 2XI is now a member of the W.I.A., but unfortunately QRT at the moment, due to Uni. exams. 2JY, one of the old old-timers, has shown up in a new QTH at Mona Vale—very nice, being able to plunge the bottles in the surf to cool them off! T2L the proud possessor of a BC 348, which now allows him to hear the QRM louder than anyone else.

2AND is another mad with the exams—accountancy, though, in his case. Manages to sneak in the odd contact now and again to keep himself sane. 2AMB working them merrily on 20, but would like one of those super-dooper Yank receivers to help him get among the rare ones. 2YM has departed for the realms of the v.h.f. gang, joining the earbashers on 144. 2MQ has been busy building a brace of beams, two three-element wide spaced arrays, spaced one half wave above the other and fed in phase for 144 Mc. Claims it's that good you can hear signals with headphones on the end of the feeder—he has a three element wide-spaced on 50 Mc., so is really in the business! 2ATK, of Ryde, recently received his new call and expects to be diving madly into the 144 Mc. pool any time now.

Correction to last month—2ZN has been active on 50 Mc. for quite a long while, but after a couple of months' silence has appeared with "noo vigger," fighting his way out doggedly from under that mass of VIS antennae. 2AH, another of the old-timers, perking away strongly on 50 and 144 with great success. 2TF in there pounding the brass on 14 Mc. after a long silence.

SOUTH SYDNEY ZONE

The main item of interest for this month is the appearance on the air of the Kingsford District Amateur Radio Club with the call sign of VK2AKC. The club operates on 7, 14, and 144 Mc. 2VA was unlucky to have his tower blown down but a new one is well under way. Several locals have been very active in various contests, particularly those on the v.h.f. bands; 2ABC, 2WJ, 2VW still fighting for local honours with 2WJ in front at the moment.

2ABC manages to work a bit of choice DX on 10 in his spare time. 2WJ now operating on 288 Mc. as well as 28, 50, and 144 Mc. 2ABB has reappeared on 144 with a very nice signal and 5 element beam. 2UV active on 144 but should be on 20 and 40 soon. 2VW spent an anxious Saturday afternoon listening to three VK5s having a three way on 50 Mc. and hoping they would listen on the band. I listened to you for an hour chaps. Managed to click with VK4XD later. 2AB still rebuilding but should be on again soon. 2AC not heard for some time now, must be working overtime. 2ABU heard occasionally working some nice DX on 20 phone. 2VA put up a nice score in the VK-ZL contest and later heard in "CQ" contest with temporary antenna.

DX NOTES

As 2ACX is away on vacation he has asked me to write the notes for this month. Why he picked me I don't know!

During the month, most of the week-ends were taken up by the VK-ZL Contest. Most of the well-known VK2s were active in the Contest with the best score apparently being obtained by 2RA. 2VA was heard consistently but maintains he wasn't flat out, whilst 2EO did not get started till the second week-end. 2QL was busy exchanging numbers although, I believe, not a competitor. 2DG put up the best known score, 91,834, for 14 Mc. c.w. only. 2ZH excuses his low score as due to poor antennae, so I'll use the same one.

The rare ones heard on the band during the Contest were CZ2AC in Monaco on c.w. and TA3FAS on phone and c.w. on 20 metres. The best on 10 metres appeared to be FF8SN and ZD2RGY. The remaining week-end was taken up by the phone section of the "CQ" Contest. Most sought after stations were ZC1CL, ZC6XY, AR8BM, 4X4AA and 4X4AD. No this is not a misprint, both the latter stations are located in the newly declared state of Israel. My guess is that this country will soon appear on the official list. So much for Contests.

2YC tells me that cards are in from LZ1XX and EZ4X for QSOs as far back as 1946. The first should count for the DX C.C., but as the latter bears no information as to QTH, no credit could be allowed. Other cards coming through are FO8AA, VP1AA and ZK2AA, also a batch from TF.

In VK2 40 metres has been no good for DX due to QRN during the most of the month. A few Ws and Pacific Islands, such as KH, KM and KX are heard in early evening, but there has been no sign of Europeans. On the other hand, 10 metres has been open most evenings for Europe with plenty of good contacts available on both phone and c.w. Rare ones on 10 were AR8AB and FF8SN on phone, and GC4LI and FA8IH on c.w. Other European countries and Gs are too numerous to mention. Twenty metres has been comparatively dead, both in the afternoons and early evenings, but for the patient a few choice ones were to be had.

Best ones QSOd from this QTH were C3EA on Formosa, YJ1AA, KX6BA, and TA3FAS all on phone. Those contacted on c.w. included UF6KAB, VP3JM, VP7NK, PJ0X, and MP4BAB (ex-VS9GT in Oman) on c.w. ZD1AA and ZD1PW were also contacted, but by the strength of ZD1AA's signal I doubt if he is in Sierra Leone. The other most sought after station was ZD2RGY who is heard consistently, but I think his only VK since VK2HZ is VK3BZ. Those who where lucky enough to work ZS2MI on Marion Island will be pleased to know that this has been grouped with Prince Edward Island for a new country. He has already QSLd.

To 2TG and others who have written to 2ACX regarding this column, he assures me that he'll reply upon his return and that any suitable ideas will be included.

From across the Tasman, ZL1HY is the first ZL to receive a W.A.Z., also the first ZL to send his cards to the R.S.G.B. for the Empire DX C.C. ZL2GX still needs one card for a W.A.Z. as does one VK2 that I know of!!

If this column appears a bit small this month don't blame me, as I don't spend as much time on the air as does your normal scribe. So thats the lot chaps, and dont forget, if you have any DX news send it along to 2AOX at 12 Shackel Ave., Kingsgrove, together with your zone and country list for inclusion in this column. 73—2DI.

Honour Roll—Phone/C.W.

VK2DI	40	178
VK2ACX	40	166
VK2YL	40	160
VK2EO	40	150
VK2HZ	40	140
VK2QL	40	140*
VK2TG	38	141
VK2RA	38	128
VK2VN	37	127
VK2BA	37	109

* C.W. only.

SEASONS GREETINGS TO VK2 HAMS

N.S.W. Country Zone Officers: 2PA, 2FP, 2YL, 2QA, 2DO, and 2OJ extend Seasons Greetings to all Country Amateurs in N.S.W.

In 1949 they would like to hear all the country news for their notes; whether it be about beams, babies, or even bottles!

NORTH COAST AND TABLELANDS

2ADE worked 2ADT on 50 Mc. (2148 to 2205 on 27th October), nice work. 2AGM not very active in October due to caravan construction job; 20 metre beam not in action after damage from high winds. Caravaning is catching, 2SL also on the job and hopes to have the house on wheels finished for Xmas; been working Doc 2LH on 6 metres—Casino-Lismore link. 2LH remodelled to obtain more drive on 10 metres, has had number of Ham visitors recently. 2RK holidaying but using 8JK to Europe on 20 occasionally. 2ZY has receiver completed using commercial band switched front end, reports it is working well. 2FN getting flying hours up, not active but listens on the new 640.

2AJB very active on 40 using Clapp v.f.o., reports it is an improvement on others tried, knows all the tricks of the Clapp now. 2AEY has rig housed in rack now, using anti-b.c.i. antenna which is proving effective. 2NY getting the Europeans on 10 metres. 2DK powered by batts, gets good results on 40. 2SH still catching big ones, troubled with high line noise in dry weather. New call at Nambucca Heads is 2WY. 2ARR visited Port Macquarie during October, operated portable. 2ZS, 2ASF, 2DS, 2SH, 2ARR, and 2PA had a get together and the usual good time was had by all.

NEWCASTLE

2BZ on 6 looking for v.h.f. contest contacts, has been on 10 also. 2PQ has three elements on 10 using T match and is now getting excellent DX results, has acquired a crystal mike. 2AFS active from daylight to dark to make up during the week-ends time lost while away week days. 2ZC has built Clapp v.f.o. impressed with its simplicity and 100 per cent. reliability and stability. 2ADX now about to elevate the three elements, should be really amongst it when these notes appear in print. 2AGD heard testing a quad antenna, shows great promise the bottom being only two feet above the ground. 2FX heard sometimes on 10, nice quality. 2AMM, 2CI, 2CW, 2ANG heard occasionally on 20 and 40 metres.

COALFIELDS AND LAKES

2YO making a comeback and has new receiver going. 2KF seems rather quiet for a change, perhaps a little busy. 2KZ busy on 6 metres but keeps an ear on 10 for Delaware on phone. 2TY has been very active on 10 metre phone with beam, but at the moment holidaying at the Lake. Old-timer 2JZ is staging a successful return judging from the amount of DX calling him. 2PZ also busy, don't waste that tower Chris—visitors from Sydney viewing it from a distance thought it was the local b.c. station. 2MK QRL also. 2ADT spends lots of time on 6 metres, nearing 100 countries on 10 metre phone, also made the DX C.C.—congrats. 2YL very quiet, may break out anytime but at the moment painting instead of DXing. 2AEZ can be heard punishing the DX on 20 most nights. 2OC and 2RU still on 6 metres and don't even come up to the lower frequencies for air. 2KR promises to supply notes from the Lakes area each month.

WESTERN ZONE

2ACU works mostly 40 phone in the evenings. 2YN at Bourke is trying the long wire to end all long wires, approx. four miles of it. Telephone mechanics in the district please note. 2XE has settled at Coonabarraban (the place should be in Wales!) using ATR2A, the quality and signal is excellent. 2QA HAS worked 10 countries post-war! 2AMR has at last got the 20 metre beam working nicely, raised it to 55 feet. 2II concentrating on 20 metre DX. 2TG works them in all directions. 2JW has the high power rig going, sounds all right too. 2BT works everything on his 20 metre rotary.

2ALN a new Ham at Wyalong uses 10 watts with fairly good phone. 2AIK not heard during normal hours, some b.c.l. trouble. 2NS doing fine with his short long wire on 20, 141 countries up post-war with over 100 confirmed, new 20 metre rotary under construction. 2RN a new one in Bathurst almost ready to transmit. 2LY QRL at a school in Sydney and has an 813 on 6 metres. 2FI has been away on holidays. 2LZ busy in the v.h.f. contest on 50, 144 and 288 Mc. 2HZ is chasing DX. 146 post-war but a few short of the 100 confirmed still. 2EF not active. 2FH has been in trouble with his four elements wide-spaced on 20 from gales, some repairs necessary.

SOUTH COAST AND TABLELANDS

The Young gang have been active on 6 metres. 2TC been working 2GU at Canberra cross-band. 2TA visited the A.C.T. and was entertained by 2GU. 2VS, 2PI, and 2VT all active, the first two met personally and there is a possibility of another 6 metre signal from the zone shortly I hope. 2WA is active on 20, believe also there was a family addition, congrats. 2OW Temora doing nicely with Class B linear 807s, best KJ6 on 40 phone. 2ASB heard on 40, nice signal, believe he is in Canberra. 2AIK has QRM in Wyalong now, 2ALN is on the latter band and has the honour of hearing the first European on 10 metres many years ago. 2WP from the 'Gong very active, nice signal and nice operating too!!

2TA has new 6 metre rig, getting S9 from Canberra and Tumut. Receiver is 6AG5 r.f., EF50 mixer, and 6C4 oscillator; has converter ahead of a BC348, new beam under way with propellor pitch motor for rotation. 2PN has modulation trouble, heard consistently in Young on 6. Yass reports—2ALS active on 40—2AKE Rye Park with a good sig from QRP. 2JQ had a visit from Bishop Ash who was introduced to Ham Radio in a "Home to Lunch" session. 2OY been heard calling DX on 20. 2DO collected TF3EA and HP1BR on 20 and ZK1AS on 40 phone.

SOUTHERN ZONE

2EU has a rig on 7 Mc. c.w. but present antenna at 8 ft.—a bit low. 2ANQ going to VK3 Western Districts on holiday, will call on Hams en route. 2OJ pushed 10 metre beam out of reach (temporarily) of juniors and XYL, pruning and greater height to be attended to on return from holidays. 2BW working 6 metres but not heard in Albury as yet, hope to give you more co-operation soon o.m. 2QE and 2QD trying to find a way to get on the air; suggestion, build a rig!! Old Alburyite 3YD ex-2IG been heard on 20 chasing DX. Notes to 2OJ please each month.

VICTORIA

Members will regret to learn of the death of Ken Ridgway's father. Ken (3CR), many will remember, was the Technical Editor of this magazine for many years, but owing to pressure of business had to resign from such position.

EASTERN ZONE

News of the Zone's activities last month were limited owing to preparations being made for the zone's convention. 3WE has been hard at work but has found time to build up a v.f.o. using a 6A6 and by reports is very satisfactory; you will be able to dodge them now Bill. 3QZ is also QRL but hopes to get going on 50 Mc. again soon. 3ACL is a new Ham and made his first appearance in the hook-up with a very nice sig. Eric has also been doing some good work on the 50 Mc. band. Other newcomers to the 50 Mc. are 3LV and 3TH who spend quite a lot of time working and experimenting on this band. Reports they received from 3DI are very encouraging, keep the good work up fellows.

3PR has revamped his shack and has it looking very nice. Ron also has his a.c. gear ready for operation as soon as he gets the power on, which by reports, seems not too far off. He also has been doing some good work on 20 metres with his Type 3 Mark II. 3CI is still very keen on both 144 and 50 Mc. and has been doing well on both bands when out portable. Sid also has a new rig on 80 metres which is working well. 3VL and 3US have been putting quite a lot of spare time in erecting new masts, also carrying out tests with beams at different heights and locations with very interesting results. 3BB, 3ALS, 3AKM, and 3ANC have not been in the hook-up for quite a while, but believe that 3BB is re-building. 3SS busy but finds time to build new gear for the shack which, by reports, is looking f.b. 3AEP has his Bendix transmitter and receiver going well now, can run near the 100 watts; looks like Kel will be like 3AHK and go for the DX in a big way. Ossie is kept busy on the farm these days.

The monthly meeting of the Mornington Peninsula Sub-Branch was held on 8th November and there were 16 members present. Minutes of the previous meeting were read and confirmed, banking arrangements were again deferred until next meeting. Sgt. Roberts was elected Vice-President for the Sub-Branch. 3RR moved that the appreciation of the meeting of the voluntary work done by 3KT, acting as Secretary, be placed on record; this was seconded by Sgt. Wright. It was unanimously decided on the motion of Sgt. Roberts that the name Mornington Peninsula Sub-Branch be adhered to in order that the branch may retain its identity. There was a very interesting lecture given by 3BQ on crystals and crystal grinding, and a crystal donated by 3BQ was raffled.

CHRISTMAS GREETINGS

As President of the Victorian Division I send greetings to all members and trust that a Happy Christmas will be with us all.

Lots of DX and 73,

Bob Cunningham, VK3ML.

NORTH EASTERN ZONE

Your scribe has not had time to snoop on the bands this month, so little dope to go on. 3ACW reports the nurses in the hospital very interested in articles by "Gremlin" in "A.R." Professional interest probably. 3UI, apart from building a six metre portable, has not been very active. A rumour from a reliable source (in Foster) says Alan has a YL. 3GD now using 6V6, 6V6, 807, with 6N7 mod. George doing well on ten, in spite of obsolete frequency control. 3ACK new station in Mooroopna. 3XZ using phone but 3AT back to c.w. 3TS active but no dope. 3APF's sister keeps him busy washing dishes in between working Gs on ten. 3DW and 3KR are still the best earbashers in the zone. 3YV has a dry joint (not the house), and has been off colour after working I.C.A.S. ratings too long. We hope the wrist is better Howard and you are regaining emission. 3ABG removed the fan from the rig and put it at the operating position for the hot weather.

3CN has recently added a few more countries to his long list. How about duplicating it on phone, Snow? Have not heard the Mountain boys, or the North gang on the air. What is doing chaps? The v.h.f. gang are all waiting for six metre DX. The band has been open several times, but no stations heard. The weather has stopped portable activity lately. 3YV, 3JK, 3UI, 3APF, 3ACW, and 3ABG are ready on 144 Mc., but no big beams up yet. "Whiskers" Tacey is up to four switch changeover again. How about sending the surplus here Doug, so we can do away with some twisted connections.

SOUTH WESTERN ZONE CONVENTION

The South Western Zone held its half yearly Convention at Geelong on Saturday, 6th November. During the day Hams arrived from various country towns to attend the Convention. Some of them met at 3BU's shack and later proceeded to the club rooms of "The Geelong Amateur Radio Club," where everybody eventually made their way too; and had a rag chew prior to the dinner which was held at the "Garden Gate Cafe" at 6.30 p.m. Thirty-three Hams sat down and enjoyed themselves to a really good dinner. 3ASV presided at the dinner. The topic which was heard being discussed, would you believe it fellows, was Radio!

After the dinner the Hams proceeded to the Bostock Hall of the Gordon Institute of Technology where the meeting was held. In the absence of the President 3BI, 3BU, a Vice-President, took the chair with the assistance of 3ASV and 3BE. After the members of the Zone and visitors from other zones had been welcomed there was a roll call, each Ham stood up in turn and gave his call, name, and town. Those present were 3BU, 3SY, 3SW, 3AKE, 3VF, 3BW, 3ABE, 3AJF, 3ALG, 3IC, 3AML, 3APG, 3WT, 3ABK, 3SE, 3GR, 3VA, 3HW, 3UT, 3AKR, 3PS, 3AG, 3ED, 3LS, 3RT, 3VC, 3RD, 3BE, 3ASV, 3WQ, 3PW, 3ANL/7EB, and 3RU.

The trophy, which was an 832 donated by 3AJR for the longest distance contact on 144 Mc. was won by 3BW. 3AKE, got second place, the trophy for which was an 813.

Two PEO4/15A type tubes have been donated by 3PD, and it was decided to have another 144 Mc. contest. The first prize would be these pair of tubes. The Disposals Committee donated a h.f. tuning unit for second prize.

GLO-RAD

Introduced last month the Series 2090 CO-AXIAL DIPOLES for 144 Mc and 83 Mc. This month we are able to announce the availability of SERIES 2091 CO-AXIAL CONNECTORS.

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The trophy for the best piece of Ham constructed gear was won by 3ABE who had entered a r.f. frequency meter. 3WT took second place with his crystal oscillator. The first prize was an 813 and second prize was an 0-50 Ma. meter donated by 3KX. There were six entrants for this section: 3ABE, 3WT, 3BW, 3ALG, 3ABK, and 3IC.

3UT was appointed publicity officer with 3ALG as his assistant. The DX Contest was won by 3MC with 64 points, 3HG second and 3BI third. After the zone matter had been dealt with 3WQ discussed things about Disposals, and later talked about "Sub-Branches" of the W.I.A. 3LS gave us an interesting talk on the Emergency Network. The meeting closed at 11.5 p.m. when the Hams proceeded to the club rooms of the Geelong Amateur Radio Club where light refreshments were served. The Disposals Committee donated an aerial relay unit to the Ham coming the greatest distance to the Convention. This was presented to 3UT, of Ballangeich, who travelled 140 miles to attend. The Disposals Committee also donated some gear which was auctioned for the funds of the zone.

Altogether everyone had an enjoyable time. Some of the Hams stopped over night, and were taken around the Ham shacks. They also visited the studio and transmitter of the local broadcast station 3GL. It was decided to hold the next Convention at Colac next April. Special thanks go to all those chaps for the work they put in to make the Convention a success.

Operating on 144 Mc. in Geelong and District are 3BW, 3VF, 3BU, 3AKE, and 3AJF.

NORTH-WESTERN ZONE

Interest in v.h.f. is growing in this zone and will reach an all time high with the visit of 3HK to the zone bringing his 6 and 2 metre portable, in response to a long standing invitation by 3BM. Keith made the trip on 13th November. 3OA has a receiver going on 50 Mc. and hopes to have the transmitter soon (p.p. 807s), also SCR522 on 144 Mc. While lowering his 20 metre rotary recently, the mast swung sideways and a guy attached thereto neatly decapitated the lounge chimney. Fortunately not the chimney that supports the six metre four element rotary! 3TL has his lonely 10 metre rotary up and working OK. The indicator with its circle of lamps is a thing of beauty, but Treb has found it necessary to rebuild the driver stages of the rig to get enough drive for the p.p. 801s. We hope Treb will get on soon.

3ZK is on again for the first time post-war. Jim and XYL has been on a trip south and called on various Hams. Roy of 3CE, loaned Jim an AT5 on condition that 3ZK came on the next zone hook-up and Jimmy made it with nice phone, plate modulated, but temporary aerial. 3CE with new mike, new modulator and AR8 puts out an even better signal on 80 on his 18 watts. Roy's rig is always outstanding on 80, using half wave zepp supported one end on a 80 ft. lattice tower. 3LU has left Quambatook and is now home at Sea Lake. Is building a new transmitter, all band from 80 to 6, using p.p. 807s in the final. 3AWK should be in his new home by Xmas, and then will erect a decent antenna and should get out better. His converted TA12D is more frequency stable than most crystal rigs as checked on the scribe's BC221T.

3ACE is often heard on 40 and 80 but has not been in the zone hook-up lately. 3JG also has resisted all appeals to join the gang on 80 on Sunday mornings. 3HR has nearly completed the rewind of his alternator and will join us again soon. 3BM is to attack six and two metres with the help of 3HK. The proposed antenna is stacked folded doublets with reflectors on six, and stacked pairs of halfwaves in phase on 2 metres with reflectors, all rotated with feathering motor at the head of the 70 foot mast. Proposed transmitter v.f.o. driving 807s as multipliers to 812 push-push doubler driving 35TGs in p.p., 100 watts. SCR522 for 2 metres.

GEELONG AMATEUR RADIO CLUB

There was a good attendance at the last meeting of the Geelong Amateur Radio Club. After the business, reports on the activities of 3BW and 3VF on 144 Mc. were read by 3ALG. This was followed by an address by 3IC on previous years of Ham Radio. Bob gave a description of his AR8 receiver and his American type CRV52233 aircraft transmitter.

At the next meeting members of the club listened to a lecture on the Cathode Ray Oscilloscope by 3VF. Bruce used the blackboard and oscilloscope to illustrate his lecture. Mr. Oliver, of Singapore, and Mr. Reece, who were visitors to the club, were welcomed by the President.

A question night will be held on Monday night. Intending members of the Club are invited. A visitor to the club was Mr. R. Davey. It was decided by the members to apply to the P.M.G's. Department for an Amateur licence. 3APG/WC, who described his Type 3 Mark II., finished off his lecture with a demonstration. At a later meeting 3WT was the speaker. He brought along a complete Ham Station and related his experiences as an Amateur and demonstrated receiving equipment covering all bands and low powered transmitters with a band coverage from 2 to 80 metres.

CENTRAL WESTERN ZONE

Congratulations from the zone go to 3OD at Horsham for his f.b. reception of 3BW on 144 Mc., too bad a transmitter was not in operation at Horsham to make it a two-way, however as the signals can get to 3OD no doubt they will go back next time. 3OD by the way is a new one to the zone, and together with 3OW, 3PX, and 3ALC we extend greetings, and hope for a long and happy association with the boys. 3PX has just arrived lately in Stawell from Mildura. 3ALC is busy making the name of Buanga known to a wondering world and 3OW is demonstrating the effectiveness of QRP from Lubeck, that little spot by the way has quite a large Ham population with three active stations and a possibility of a fourth in the near future.

3AX has his series-phased beam working now but the receiver is not so hot. 3AKP has become a confirmed DX addict on 14 Mc. and can be heard diligently stalking the victims with his v.f.o. Keith has now passed the 50 mark, and looking for that DX C.C. 3DP still putting out his usual workmanlike c.w., but suffers at times from low battery voltage when things get a wobble up. 3GN, who is now leading a quiter life, will be turning more of his time to 50 Mc.: George has a three element beam ready and should be active soon.

That little bloke 3XC has been at it again, and generated a strong second harmonic of unsuppressable proportions, what about better filters Bill? 3YW is building a four element beam for 50 Mc. and revamping the receiver to double conversion and grounded-grid r.f. amplifiers, main snag at the present is time and the weather.

For those who did not go to the Convention or listen to 3WI broadcasts, the zone hook-up has been changed to 2 p.m. second Sunday in the month on 7120 Kc.

QUEENSLAND

The October general meeting was held on the 29th inst. in the Institute's Elizabeth Street room. The President, 4AW, presided over one of the largest gatherings of VK4 Hams since the war; there being present 53 members.

4AW welcomed visitors VK2JF, VK2AC, ZL1GE and ZL4HF. Visitors from other parts are always welcome and we hope Hams visiting Brisbane will drop in at future meetings.

Council has been fortunate in getting still another room in the city area where Hams can meet at any time for a rag chew.

Council and Student Classes will in future meet in Room 16, Victory Chambers, Adelaide Street.

In addition, these rooms will; sometime in the future, house 4WI and a reference library.

The position of Traffic Manager was relinquished by 4NO who has been transferred to VK2. We are sorry to lose you Norm and wish you all the best in your new home. The position of Traffic Manager has been offered to VK4AG.

The general business was followed with a lecture by VK4XG—the subject "The Panoramoscope." Gus gave a very interesting lecture explaining very lucidly the technical points and followed up with a practical demonstration. More lectures of this type would go a long way towards increasing the attendances at general meetings. After the lecture the gathering broke into two sections. A number gathered round the blackboard and very soon graphs and equations covered the board.

"While words of learned length and thund'ring sound
Amazed the gazing rustics ranged around."

So the writer migrated to join the other group at the far end of the room where—

"yarns much older than the ale (coffee) went around."

Members for the first time wore identification tabs. Now we know what the guy, who owes me that QSL, looks like.

We are pleased to announce that Library Service is nearing the fifty subscribers mark now.

A D.F. Field Day was held on 17th October and from the point of view of numbers participating was very disappointing. 4RT was first in the 7 Mc. section with 4LM second. 4ZU, 4XG, 4KB were the only ones in 50 Mc. section, and it is not known who found the hidden transmitter first.

4WI has added yet another band to its Sunday morning transmission. The 80 metre band is now used simultaneously with the previous four bands.

Zone news this month is very scarce and we point out that Zone Managers should get their zone news to me by the first of the month.

In concluding this section of the notes, on behalf of the Council and myself I extend to all VK4 Hams the compliments of the season and may 1949 bring us that which each of us seeks.

ZONE NEWS

Townsville Zone.—Townsville Club recently moved into new rooms and hope to get the rig on the air soon Zone Manager is VK4GD. Associate members up there are very keen. A certain Associate rode 28 miles on a push bike to attend c.w. classes. Trouble with bike on the way was the cause of bringing him into 4RW's QTH. Bob put him on a train and saved said Associate the return trip by bike. 4FE left this Zone to become VK1AB on Macquarie Island. Arthur worked 32 Zones on 28 Mc. before leaving the north.

South West Zone.—4TY has worked 123 countries with 80 veries. The Manager, Eric, reports that some members of this zone are still holding magazines and requests that these members return books immediately.

Mackay Zone.—4AW writes "Those heard operating on 20 metres are 4FH, 4BQ, 4KW. A new Ham 4AM hopes to be on very soon on c.w. 4MA still rebuilding super rig. 4FW building a new receiver. 4MU at Finch Hatton is working the boys on his low power. 4FH and 4MA very busy on Eisteddfod work."

Bundaberg Zone.—We are pleased to report the formation of yet another zone. The Manager of this zone is to be appointed later. On the 21st November, the Bundaberg District Radio Club will celebrate its second anniversary. President is 4PG, Treasurer 4XJ, and Secretary 4HE.

SOUTH AUSTRALIA

The monthly general meeting saw another splendid lineup of enthusiastic Hams gathered to hear Mr. Dobell give a very interesting and instructive talk on "Acoustics." To many members the talk was surprising, inasmuch as very few realised that the study of acoustics had progressed so far and was capable of being treated in such an interesting manner. The vote of thanks which was so ably proposed by Jim Paris was received with more than the usual signs of acclamation.

5JE (Ted Cawthron) signalled his return to the fold by an impassioned delivery to the meeting of his pet subject (keeping the phone signals out of the c.w. end of 7 Mc.) and 5LL (Luke Lucas) spiked his guns by an equally forceful plea on behalf of his pet subject (keeping the c.w. signals out of the phone end of 7 Mc.) and between the pair of them, and their supporters, the rest of the meeting was alternately convulsed or indignant. Another matter that was brought up was that of the anonymous letter received by 5YQ and 5KO regarding their alleged splatter, overmodulation, etc., and everybody agreed that there was only one place for such epistles, the w.p.b. Apparently the writer of the said letter does not read "Amateur Radio" as there has been quite a number of technical articles appearing recently which clearly show that one could not overmodulate or splatter or something.

The samples of disposals equipment which were on show at the meeting caused quite a flutter among the gang, but more of this later. Just before putting these notes in their envelope I heard a rumour that Cec. Beeby (5BZ), our stony hearted Treasurer, has tendered his resignation due to pressure of business. I could say that I hoped that this news was incorrect, but I know that Cec. has been only carrying on his duties because Council has talked him into it, and apparently he has at last taken the plunge. Cec. is a good scout, a perfect gentleman, and strangely enough a good sport (most perfect gentlemen are usually pains in the neck); anyway "Battler," we are sorry to lose you but we know you have to go, and if all this soft soap has not made up for my paragraphs of rudeness to you then I have turned out a failure. It's been a pleasure working with you Cec.

I understand that Ross Kelly (5LW) has told his harmonics that Father Xmas has shot himself, and hopes to save enough, by this shameful trick, to purchase one or two things in the radio line. Oh that such wickedness should be.

The Northern boys are a bit quiet this month, they must be recovering from the field day or spring cleaning or something, mostly something I think. The Northern Net, as they call themselves, tried a quick "break-in" get-together on a week night recently and discussed the points raised on the previous Sunday morning. It was a great suc-

cess and the boys enjoyed the "break-in" procedure, although one or two still like to bash the ear. Thank Heaven for the "Bull Protectors."

My information regarding 5AP was apparently a little previous, he is only "half hitched," sorry Ron, but my advice still holds good. 5RJ should soon have a.c., sooner or later anyway, because he has been playing around with a couple of Thyratron inverters he can get a.c., but the voltages are a bit haywire. 5AP is going QRO to 100 watts. 5AX is busy making protectors and hasn't been heard much. 5BA is looking for a net frequency crystal. 5CD is trying out various modulators and mikes. 5GS was heard testing with a very good signal. 5GS had an extra good report from 5AP via 5UX. 5JY was also heard testing with f.b. modulation during the week. 5MA has ground a crystal for the net frequency.

The boys have been slinging off about 5UX and his modulation, so he got to work and contacted VR2BD on 7 Mc. the other night. That's showing them, Les. 5VM has two new sticks 35 ft. up in the air. Reckons he might have to put air warning lights on them! Heard him trying to convince 5BC that they were made of mallee!! 5XL seems to keep an ear on the net frequency 24 hours a day, is that right Lance? 5XR is still QRL with military duties. 5WG has a transceiver on 7 Mc., only 5 watts and a f.b. signal. 5MN Me No hear. 5JA is still very interested in 144 Mc. and is getting ready to work DX during the summer months. 5MS at long last has his a.c. installed and is very happy. 5CH had a bit of bad luck with his D104, but hopes that it will be OK when it comes back from VK2. 5TW is still very busy getting things organised to work his first G. 5CJ is now rebuilding his receiver, it probably will not be so efficient, but it will be more flexible. By the way, Col, sorry that I missed you, but it was my day off, and I was hoping that you would come back. Better luck next time for me, I hope.

I have to fill up this empty space on the bottom of the page, so very silently, very mysteriously, and with an expression on my face which is designed to catch the Editor napping (he suggests that it makes me look as if I have a bad attack of indigestion) and I say "my readers want to know, where is 'Gremlin'." Alright Tom you needn't bother, I'll put it in the waste-paper basket.

Rumour Department.—I can deny the rumour that "Doc" (5MD) is a recognised authority on the new ten metre beam that everybody is talking about, namely "the cubicle quod." Just an association of ideas that's all. There is also no truth that "Tommy" (5IT) is now wearing a sarong. Just because he lapses into the KH6 language with "gunga wunga dunga" or a couple of "kinga dinga pinga's," it doesn't mean that he has a hankering to discard his pants and coat. Only a siddy piddy widdy would believe that.

My paragraph last month regarding the writing on a door locker at my place of employment, to wit, 5LR and 5FQ "the dual conversion boys" was apparently taken very seriously by somebody, because the "con" now reads "per."

Heard a VK5 in the early hours of the morning calling a ZS6. The VK5 was using a four element beam and modulating at about 250.999 per cent. (I know it can't be done, but there it is). The ZS6 was sorry but he could hardly hear the VK5, yet only a few minutes later another VK5, using a common or garden long wire, and modulating 89.999 per cent. was given an R5 S9 report from the same ZS6. Perhaps some of our local technical writers could be persuaded to dash off a couple of articles on this strange phenomena!!

General opinion in VK5 this month is that "Amateur Radio" for last month was by far the best ever. Keep it up "Tomsy Womsy" and the rest of the gang, we can be just as liberal with our praise as we can with our criticism.

By the time this magazine comes to hand it will be very near the "festive season," so it now becomes my pleasure on behalf of the Council members of the VK5 Division, to extend our seasons greetings to all Hams, irrespective of birth, sex, colour, creed, or opinions. May we all unite for the furtherance of "Ham Radio," the greatest hobby of them all. Oh, and by the way, if you should be looking for a New Year resolution, what about treating Ham Radio as a hobby, and not as the be-all and end-all of everything!!

To those who have helped me with these notes throughout the year, I say thank you, keep up the good work. To those who have kicked me, well you know the old saying "where there's no sense there's no feeling," please kick me some more, it's all news.

WESTERN AUSTRALIA

Due to having to vacate our meeting rooms, the November meeting was not held until the 30th of the month, in our new meeting place in Padbury House, Cnr. St. George's Terrace and King Street, Perth.

As this date was too late for us to obtain notes, these will appear in next month's issue. Members are advised to watch the Monthly Bulletin carefully, for the meeting date. Next year there will again be a regular night set, as previously.

Preparations are in hand for the formation of an Amateur Wireless Emergency Reserve, and an excellent response has been received to a questionnaire form which was prepared and sent to all members.

From the 13th November, 6WI Broadcasts will be made from the QTH of 6WH.

PERSONALITIES

Condolences are extended to 6WT for the recent loss of his father. When these notes were written, Dave was in VK3, and we trust he was able to dig up a few of the gang during his short visit. 6LW is a very busy man these days, and we have not heard much of him on the air. We guess work is getting him down. 6MB has now a new two element rotary beam working, and it seems to be doing quite a fine job. Although 6BC has not been to a meeting for some months, he seems to be a little more active on the air, as he is even heard on 10 metres.

6DU is a new call sign for an old-timer. 6DF, Maurie, has now two call signs the latest—6DU, being for his West Perth QTH. Congratulations are also extended to him on his recent addition of a second operator. 6MU, although now news from the Merredin district has been received, we still hear overseas stations calling Mal, so we presume he is still active. What about some news Mal? We believe 6HT is temporarily off the air. We trust that this is not going to be a permanent sojourn, and we will hear Harry back again shortly. 6GC has been heard on the air recently on 40 metre c.w., and it is hoped that the time will not be far distant when Bob is a regular inhabitant of the ether.

TASMANIA

Nothing remarkable seems to have happened in VK7 during the last month or so. The usual monthly meeting was held on the first Wednesday of November and as usual was well attended. Our President 7LJ was absent, suffering from a bout of the 'flu, but is now well again and back on deck.

An interesting talk on "Radio as applied to Submarines" was given by Mr. Gee who went "under the sea in ships" in World War I.

The Food for Britain Appeal is still going strongly and letters from G land tell of the value of these parcels to the folk on the other side of the globe, so keep the good work going chaps.

The bands seem very dead down this way of late, even the locals seem to have quietened down quite a bit, maybe it's something to do with spring. By the way, can any VK7 tell me on what day spring occurs this year?

By the time this appears in print, the Hamfest in Launceston will be a thing of the past. About thirteen Southern and Country members are making the trip and all are looking forward very much to the event, personally I've been eating lots of salted peanuts to get up a really sixty-four dollar thirst!!

It looks as though we shall be loosing our worthy Treasurer in the near future. Alan has decided to trek north. Port Moresby is his destination, still as long as he takes his boomerang he should be OK.

Had a letter from 9YY a couple of days ago. Bill (ex-7YY) is still up in Wewak, but isn't doing much Ham Radio, as he is much too busy at the key punching for a living to have time for Ham Radio.

Ham chatter is in short supply this month, in fact I'm clean fresh out of news, so will see you all next month, wish you a Happy Christmas, lots of DX in the New Year and say 73 and cheerio.

NORTHERN ZONE

During the November meeting of this zone I mentioned that I possibly would not be able to write these notes in time for publication and I was immediately informed by the meeting that it didn't matter as all the zone members knew what was going on and the outside world wouldn't care anyway. On thinking this over I came to the conclusion that they were possibly right. From now on the problem becomes difficult because if I am to continue these notes what can I write about that is interesting?

Owing to the unadvoidable delay between the time of compiling the notes and the distribution of the magazine, it is impossible to give advance details of future events and write-ups of meetings that took place two months ago (one month's delay only!—Ed.) are as stale as Sunday night's bread. If all zone correspondents went into this matter in their zone they might get some ideas. Who knows, it might even cause major changes in the set-up of "Amateur Radio."

It may be of general interest if it is mentioned here that there are at least five Amateurs in Launceston who are active on 144 Mc. and that most of these stations are operating every night. Power used is relatively low, possibly around 25 watts and the receivers are usually of the super-regen. variety. All stations are using either three or four element beams. It might pay mainland stations to swing their beams down south occasionally.

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FIFTY AND UP

VK5 AND VK6 MAKE CONTACT

STOP PRESS.—During the early evening of the 6th November, VK5GB was listening on the 50 Mc. band. At 2020 hours he heard VK6HN of Kalgoorlie, on 50.2 Mc. calling CQ at S9. VK5GB made contact with VK6HN and reports were S9 both ways with some QSB. After concluding the QSO 5GB passed it over to 5KC who also made contact. Then 5KC handed it to 5RT who made the third VK5 to QSO VK6HN. The band was open for 1½ hours.

The band opened again at 2100 hours on the 15th November when VK6WB of Albany contacted VK5GB on the 50 Mc. band. This contact was rather astounding seeing that this QSO was 6WG's first on six metres, and when 5GB returned to 6WG's CQ, 6WG was speechless. Strength reports were S9 to S5 both ways. The same night 5GB heard 6HN again and also 6SA.

On the 19th November VK2 stations were heard in Adelaide on 50 Mc.

NEW SOUTH WALES

The most important news this month has been the sudden re-appearance of the Interstate Sporadic E Layer DX signals; and VK3, VK4, VK5, and VK7 stations have been heard and worked in Sydney at various intervals and varying signal strengths on 50-54 Mc.

VK2RU in Gosford has been keeping a check on the Aircraft Beacons in the various capital cities and uses this knowledge to advantage apparently, as witnessed by his success to date in the v.h.f. contest. 2LY is another station who is well to the fore in the point scoring and looks a dangerous rival to the honours.

major disturbances were evident in and around the metropolitan area. However country stations may have noticed some changes in noise level and if so we request them to send these observations to the Secretary of the V.H.F. Section, Box 1734, G.P.O., Sydney.

This information would be very valuable indeed to the scientific people who use this data in coupling their research records on propagation and ionosphere disturbances. We would also like to stress, while on the subject of observations, the importance of reporting any Sporadic E reflections of 50 Mc. to the Radio Research Board in Sydney. The exact time of signals coming in and going out are of the utmost value to these people, who have asked us to thank you for the interesting information which they have already received. However they are always pleased to get these observations as soon as possible after the break through irrespective of the direction and are really appreciative of our activity on their behalf. Here is a phase of our hobby where we can really justify our existence as real exprimenters.

QUEENSLAND

Renewed activity on this band is reported from Brisbane where the v.h.f. gang are now holding regularly Sunday night skeds from 1900 hours. On 30th October 4XD Townsville worked 2VW at 1645 hours. 2XX was also heard at about the same time. 4HD heard 4ZU at 1930 hours on 31st October but no amount of calling by Max could break through to Howard. 4HD uses a 3 element dipole with 108 ft. ribbon feeders. VK2 and 4BT were heard in Townsville during the week-end 6th November by 4XD. 4CU worked 7XL on 6th November at 1745 very strong signals both ways. 4BT worked eight VK3s on 6th November.

We understand that the newly formed club in Wollongong are very v.h.f. conscious and reports from that area would suggest that this live-wire club will soon have some equipment going on 50 and 144 Mc. shortly.

The last meeting of the v.h.f. section of the N.S.W. Division was very well attended to hear a composite lecture by Messrs. Maycock and Andrews, of A.W.A. Ltd., their subject being "F.M. Transmitters and Receivers." The hearty vote of thanks which followed would suggest that these lectures were very well received and we look forward to hearing more from these two excellent authorities on this topical subject. The next meeting of the v.h.f. section will be held on 12th November and Mr. Holloway also of A.W.A. Ltd., will tell us all about "V.H.F. Receiver Design and Technique."

All bands from 50 to 576 Mc. are well populated each night in Sydney and the v.h.f. contest would no doubt be repsonsible for this activity, which we will agree was the major thought behind the organising of the effort. However we feel sure that when the contest ends in December that the stations who participated and thoroughly enjoyed the good fellowship that existed throughout will continue to be active and help keep the interest in v.h.f. alive in this State.

The N.S.W. Division Field Day will be held at Woy Woy on 5th December and for the first time in history will use v.h.f. for a hidden transmitter hunt. The frequency chosen is 144 Mc. and the Gladesville Radio Club has been asked to provide portable equipment for this event. A good time is expected to be had by all who will be fortunate enough to be able to make the trip, weather permitting of course.

During the recent eclipse in Sydney all v.h.f. stations were asked to observe any change in conditions generally while the phenomena was on, and to date reports would indicate that no apparent

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WESTERN AUSTRALIA

50 Mc.—The highlight of the year for 50 Mc. is the news of the band at last opening up between VK6 and VK5. On the 6th November, at 1830 hours W.A. Standard Time, VK6HM at Kalgoorlie began to hear signals from VK5. A little later he was successful in establishing a contact, and altogether, worked four VK5 stations, having six QSOs.

The signal strength was good both ways, being up to S9 plus. The last contact was made at 2000 hours, local time, with VK5RT giving this last mentioned station his W.A.S. on 50 Mc., the first station to make this achievement.

We thus have VK6HM, the first VK6 to work out of the State on 50 Mc., and VK5RT, the first station to W.A.S. on this band. Congratulations are offered by this Division to both stations concerned.

144 Mc.—This band as usual has been quite active amongst City Hams, it being by far the most popular v.h.f. band at present. As mentioned previously we are endeavouring to give details of each station working on this band, each month. This month VK6AG has given us details of his rig, as follows:—

Post-war 6AG entered the v.h.f. arena with the release of the 144 Mc. band, and the availability of the SCR522s. After the usual breakdown of condensers, etc., the set functioned as a transmitter using an 8007.69 Kc. fundamental crystal, and produced output on 144.138 Mc. This allowed an absorption meter to be constructed.

A "Walter" life-boat transmitter, which was tuned for about 175 Mc. was brought down (by adding a little capacity) to 144 Mc. By the use of the absorption circuit, this transmitter was then used as a modulated oscillator to adjust the 522 receiver. The fixed frequency arrangement was removed and a variable oscillator used. By the fitting of a 160 : 1 ratio dial, tuning is quite easy and once the r.f. stage is set no adjustment is needed to that, and the trouble of ganging was obviated.

The power unit is the regulation motor generator changed to a belt driven affair with remote starting and stopping.

An external pre-amplifier replaced the standard speech input. The radiator is a three element beam using aluminium angle (motor car footboard type). Adjustments were made using a remote dipole with germanium crystal and 0-1 Ma. meter in a tuned circuit coupled to dipole as a receiver. QTH is Darlington, 16 miles due west of Perth and S9 signals can be obtained at any hour with Hams with similar sets in Perth and suburbs.

TASMANIA

In anticipation of the 50 Mc. band opening for Interstate contacts very shortly, the gang in Hobart have been busy putting the finishing touches to their gear and getting rid of the "bugs" and troubles that seem to accumulate on little used rigs.

Those mainland Hams anxious for Hobart contacts this coming summer on 50 Mc., are advised to watch for 7AJ, 7DH, 7CW, 7GR, and 7NC. A new comer to the band this season is 7DH and he has all the necessary gear to make a good showing. An 832 in the final with 30 watts input feeding into a two element beam and a v.f.o. which, with some modifications, will give him complete band coverage. His receiver, starting with a 6AK5 (r.f.) 1852 (mixer), and 9003 (osc.), is a line-up which in 7DH's capable hands is sure to drag them in.

Another newcomer is 7AJ and has about 20 watts input to an 832. He will, he hopes, have a beam up shortly and be using m.c.w. on approximately 51 Mc. The receiver, a 13 tube all band affair, has a front end consisting of 1852 (r.f.), 1852 (mixer), and 6J5 oscillator, and this combination, with 7AJ's keenness, will give plenty of competition to other operators.

That old stalwart 7CW with his 100 watts into an 829B helped by a four element beam and an SX27 receiver is bound to be getting his share of contacts.

We are hopeful that George Richardson 7GR will be able to give a little more attention to 50 Mc.

The same transmitter as last time will be in use at 7NC. A 6L6 crystal osc./dblr. (6.25 Mc. xtal), 6A6 dblr./dblr. and an 807 final amplifier. Using cathode modulation, this set up has proved very satisfactory. Just recently a converter was successfully coupled into the main receiver and high hopes are held for its performance over the type of receiving equipment used previously. Another recent improvement (we hope) is a vertical coaxial antenna approximately 30 ft. high.

On Thursday, 4th November, at 2015 hours a VK2A——? was heard on 50 Mc. band in contact with VK2RU. QSB was rapid and signals dropped right out at intervals and correct identification was not possible. VK2RU was not heard and although a close watch was kept, the signal of VK2A——? was the only one heard.

144 Mc. DIGEST, by W. J. Hartley

One thing that seems rather odd, where the Victorian v.h.f. group is concerned, is the holding of field days once a month; one month for the 50 Mc. boys, and the next for the 144 Mc. gang. As it stands it really amounts to a two months break between each field day for a given band and so on the hearing it would be more to the point for the boys on their toes to make a 144 Mc. field day each month. This would quicken interest and would enable everybody to take advantage of any good conditions that may be present, but would be missed if the two month set-up is still used.

Best news over the past month on the 144 Mc. front is the reception of 3BW's phone at Horsham by 3OD, a distance of approximately 160 miles airline. This effort makes for a VK3 one-way phone record and it is a pity that 3OD was on receiver only, in this case a super-regen and two audio was used.

Next newsy bit is of 3QK, Churchill Island, who is on with a 522. 3QK's location is about 53 miles direct from Melbourne and should provide a nice bit of DX for the gang. Our Technical Editor (3VZ) made a quick pass at 2 metres but has not been heard since, however it is hoped that he will use his Bendix to sort out the muddle on the low end of the band. The glamour session of 3WI was well taken care of for re-broadcast on this band by 3ACM (east-west) and 3TO (north-south).

The following were heard on 144 Mc. 3AJ, ABA, ACM, ASG, ADC, EW, EM, EL, ES, EH, ED, JO, TO, MB, XM, YJ, LN, LS, BQ, and VZ while the Geelong Club was well represented by 3AKE, BU, BW, and VF. Good things are well in store for the future week-ends as the portable craze has caught on. 3ADC is building the 3ASG type of mod.-osc. and as this is the best S.-E. transmitter on the band, good signals can be expected from Leongatha at Xmas time.

Steve, of 3ASG, is too impatient to wait two months between the field days so he is making it a point, like 3XM, to always take the rig along no matter what day it is. Colin of 3AOM, having finished his portable, is now thinking of putting the big job back on the air again. Guess Dick 3AJ is still waiting for the snow at Mt. Bogong to melt before he drags the 522 issue with him. 3LS and 3ED have added to the "bottom end" by using their 144.138 rocks, this now makes eleven phones all on the one spot.

No correct scores are available as yet from the N.S.W. v.h.f. contest, however it is expected that the hard working Charlie Fryar 2NP will soon let us all know. Advice received from Vaughan Wilson 2VW is that the 144 Mc. band is that full now of stations that each one is now taking it in turns to go on, yet despite this newcomers in 2AH, AZ, AND, ASK, and AJA have managed to squeeze in. 2VW reports on the fact of hearing 5QR, RT, and GF all on 50 Mc. at S9 for a solid hour and of a two-way contact with 4XD up in Townsville.

Last minute news just to hand is of great interest, as Sunday 14th November, turned out to be quite a field day in which the National two-way phone record of 122 miles on 144 Mc. was increased to 125 miles by the same two stations 3ABA-YS and 3CI. The formers were located at Mt. Callins, Avenel, while 3CI was operating at Mt. Fatigue near Foster. Signals exchanged were R5 S5 both ways; the Avenel station also worked 3VF who was reported as S9, the latter contacted 3ABG with the same strong signal. 3ABA made contact with 3UI, of Tatura, with 5/9 signals each way; 3AJ was heard at R5 S5 and 3AKE at R3 S3.

3CI at Mt. Fatigue got through at last to Melbourne, despite the strong carrier that was running idle on 144.0 most of the afternoon. 3ED, who was at the Melbourne end of this contact, reported reception as R5 S5 for the 98 miles, quite a few of the chaps were rather annoyed at the fact of the carrier being right on top of 3CI's frequency, particularly as there was plenty of room on the rest of the band.

Things are on the move at last for a link up between the Adelaide portables from Mt. Lofty to 5JA and company at Mt. Gambier. The mainstays on 144 Mc. are 5GF, CR, GL, XE and HD, while 5FW is still using a dummy antenna; when are you going to make your debut, Eric? 5JD went mad and wrecked his 144 Mc. receiver, one job at a time Jack, however he cooled down after hearing a ZL on 56 Mc., which turned out to be a 28 Mc. harmonic and as the i.f's. tally it was not an image. A double band rig (6 and 2 metres) is under way by the lone star 5JA at Mt. Gambier. It is lined up for a 6V6 tritet, 6V6 dblr., which the 50 Mc. output, then direct to a 815 for 50 Mc. then to the 832 tripler onto a 815 for 144 Mc.; looks like John will be a push-over for the Mt. Lofty crew.

CORRESPONDENCE

CALLING A PIRATE!

60 Elimatta St., Braddon,
Canberra City.

Editor, Sir,

I would be grateful if you could insert the following:—

Dear Pirate,

I am interested in the fun you are having with my call on 14 Mc., and congratulate you on your DX. Perhaps as I don't use 14 Mc. and am not likely to for some time, there is room for us both. If you send me your name and address I'll pass over your QSL cards which I don't want, but don't you feel a bit sorry for the chaps expecting a card from me?

I'm glad you are a c.w. man, and I'm very glad you have a T9 signal. It makes me a shade less hostile, though I'd like it far better if you got a call of your own. Oh I nearly forgot, if I do get hold of your name, I'll pass it along to the P.M.G.

73 c.u.l. (I hope),

—L. E. RADCLYFFE, VK2ADM.

CRITICISM AND SUGGESTIONS

73 Portrush Rd., Toorak Gardens,
South Australia.

Editor, Sir,

I wish to protest against the reduction in the allotted space for Divisional notes. I know only too well that the committee is trying to do their best for all concerned, but I do honestly think that this latest move will be a retrograde step. I feel that the function of "A.R." is to hold the W.I.A. together and strengthen its membership internally and there is no doubt whatever that the notes from each Division were steadily achieving that end. From criticism voiced in VK5 the magazine is having a harsh judgment passed upon it and but for the notes that Warwick Parsons has laboured over, there would be practically no support for it whatever.

Since we are compelled to accept it by Federal direction, agreed upon by our delegate, I can foresee a vote against it at next Convention unless radical changes occur. If you peruse "QST" very carefully you will find that sectional notes predominate, a fact that should guide your judgment.

There should always be a section for Readers' Comments, letters, etc., and this could well take the place of such articles as "Amplitude Modulation" by VK5YQ which has been amply covered by Terman and Henney and much more lucidly so.

In general also re-prints of articles should not be included because there are enough of most overseas magazines to distribute the information in Australia and our public library lending service can cope with them if needs be. Short references to very good articles and where to get them, yes.

"Questions and Answers" should be expanded if copy is forthcoming; "Fifty and Up" considerably expanded, and if technical articles are needed, then extend on this side of the activity of our hobby with details of tubes available, antennae to use, etc.

I have tried to give some constructive criticism as well as the other type with the view of biasing the magazine into a more personal affair of the doings of Australian Amateurs in all spheres of their activities, because I feel that if the interest in its publication wanes as rapidly as the temperature at the last general meeting of VK5 did, then there will soon be no official organ of the W.I.A., which would be a great tragedy.

For a start extend, not retract the notes of each Division.

—GORDON M. BOWEN, VK5XU.

[Several letters have been received on this matter. The decision to restrict Divisional Notes was made by the Magazine Committee and approved of by the proprietors, the Victorian Division.

Some misunderstanding has arisen on the restriction of notes. Divisional Sub-Editors were requested to keep their Divisional and Zone Notes within definite limits. Such notes were not to include notes for "Fifty and Up" and "DX Notes." These were to be supplied separately for inclusion in features under those headings. The consequent result of this action will undoubtedly mean that Divisions will actually get more notes space than before except that certain notes will appear under separate headings.

Thanks for your construction criticisms o.m., but it is obvious that we cannot carry out some of your suggestions unless we receive the help of the general member.—Editor.]

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FOR SALE.—VCR139A C.R.O. tubes and sockets (low voltage type). Price 39/6 complete. G. Laver, Fish Creek, South Gippsland, Victoria.

TA12D Transmitter for sale. Complete with tubes. £15 f.o.r. Melbourne. VK3UV, 12 Royal Crescent, Camberwell.

FOR SALE.—Valves 10/- each: 6N7 (1), RL7 (2), 807 (4), 45 (1), 83 (1), 6C6 (1), 6U7G (4), 6Z4 (1), 46 (3), 5U4G (1), 6G8G (2), 6A7 (1), 6Q7G (1), 6J7G (3), VR105 (1), VR150 (1), 6AK5 2), 2X2 (1), 955 (5), 6SA7GT (1), 7193 (5), 6SH7 (3), 30 (1), 1L5G (1), 884 (1), EK2G (1), H7220 vibrator (1), 6J5G (1), 6X5GT (1), 874 (1), 6H6 (3), VR91 (1), 6AC7 (7), 1C7G (1), 6H6GT (1), 1N5GT (1), 6L7 (1), 6SJ7 (1). **Valves 15/- each:** 906P1 (1), VT90 (3), RK34 (1), 866A (2), 830B (2). **Meters 30/- each:** 0-1 amp. Palec r.f., 0-250 Ma. Weston r.f., 0-250 Ma. Triplett d.c., 0-50 Ma. Palec d.c., 0-10 Ma. Slade d.c. **Transformers:** 550 c.t. 550 5-v. 150 Ma. 15/-, 450 c.t. 450 6-v. (2), 5-v. 200 Ma. 30/-, 1500 c.t. 1500 300 Ma. £5. 6-v./250-v. Vibrator Transformer 15/-, Filament Transformer 2.5-v. 3-8-v. 10-v. heavy duty 35/-, Audio Transformer 6600 c.t. 1500/2500/5000 ohms. **Chokes 15/-:** 30 Ma. 30 H., 100 Ma. 30 H., 150 Ma. 30 H., 200 Ma. 30 H., 200 Ma. 5-30 H. **Condensers 10/-:** 2000 v. wkg. 3 uF., 1500 v. wkg. 4 uF., 3500 v. wkg. 0.1 uF. "Radio" June '39 to Dec. '46. "Radiotronics" 46-47. Plus hundreds of other items which are going for a song. W. A. S. Jolly, 229 Esplanade, Henley Beach, South Australia.

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INDEX TO VOLUME 16

RED LINE

TRANSFORMERS OF DISTINCTION

HEAVY DUTY AMPLIFIER TYPE

The transformers listed in this section comprise a wide range of types suitable for practically any circuit requirements. Careful attention has been given to their design and construction to produce robust, economical and reliable units of maximum dependability.

Temperature rise conforms to accepted practice for electrical apparatus of this nature, and will not exceed 35-40 degrees Centigrade for continuous operation under full rated load. Unless otherwise stated, current ratings are based on their use in choke input filter circuits, and while insulation is ample to cover the added peak voltages involved in condenser input system, H.T. secondary current ratings should be reduced by approximately 20% to allow for the severe heating effect due to the poor form factor of rectified current. The aproximate DC voltage available at the input to the filter system is given for rectifier valves normally used.

All Red Line units are baked and impregnated with super insulating varnish and are specifically made for use under adverse climatic conditions.

Item 12. TYPE NO. 15353.

Prim: 200-230-240v. ..... 110vA. ..... 50 cps.
H.T.: 350 CT 350v. 150mA. Cond. Input.
Fils: 5v-3A 2.5v-5A 6.3v-3A
Base: 4½ x 4 x 4¼" H. ..... Wgt. 9lb. 4 ozs.
Mntg: V11 ..... "S" is 2¼"

D.C. Volts	Choke Input	Cond. Input
5V4	285v	350v
83	290v	
5Z3	260v	350v

Item 13. TYPE NO. 15403.

Prim: 200-230-240v. ..... 110vA. ..... 50 cps.
H.T.: 400 CT 400v. 150MA. Cond. Input.
Fils: 5v-3A 2.5v-5A 6.3v-3A
Base: 5 x 4½ x 4¾" H. ..... Wgt. 10 lb. 12 ozs.
Mntg.: V15 ..... "S" is 1¾"

D.C. Volts	Choke Input	Cond. Input
5V4	320v	405v
83	335v	
5Z3	290v	400v

Item 14. TYPE NO. 20353

Prim: 200-230-240v. ..... 140vA ..... 50 cps.
H.T.: 350 CT 350v. 200mA. Cond. Input.
Fils: 5v-3A 2.5v-10A CT 6.3v-3A
Base: 5 x 4¾ x 4¾" H ..... Wgt. 12 lb. 8 ozs.
Mntg: V15 ..... "S is 2"

D.C. Volts	Choke Input	Cond. Input
5Z3	240v	320v
83	300v	

Item 15. TYPE NO. 17503.

Prim: 200-230-240v. ..... 145vA. 50 cps
H.T.: 500 CT 500v. 175mA. Cond. Input.
Fils: 5v-3A 6.3v-3A 6.3v-2A.
Base: 5 x 4¾ x 4¾" H. ..... Wgt. 12 lb. 8 oz.
Mntg: V15 ..... "S" is 2"

D.C. Volts	Choke Input	Cond. Input
5V4	410v	470v
83	425v	
5Z3	375v	480v

Item 16. TYPE NO.20453.

Prim: 200-230-240v. ..... 150vA. ..... 50 cps.
H.T.: 450CT 450v. 200mA. Choke Input.
Fils: 5v-3A 6.3v-3A CT 6.3v-3A.
Base: 5 x 4¾ x 4¾" H. ..... Wgt. 12 lb. 8 oz.
Mntg: V15 ..... "S" is 2"

D.C. Volts	Choke Input	Cond. Input
83	380v	
5Z3	345v	460v
5V4	340v	450v

Item 17. TYPE NO. 25503.

Prim: 200-230-240v. ..... 190vA. ..... 50 cps.
H.T.: 500 CT 500v. 250mA. Choke Input.
Fils: 5v-3A 6.3v-3A 6.3v-3A.
Base: 5⅜ x 5 x 4¾" H. ..... Wgt. 15 lb. 8 oz.
Mntg: V15 ..... "S" is 2½"

D.C. Volts	Choke Input
5Z3	355v
83	400v

Item 18. TYPE NO. 25563.

Prim: 200-230-240v. ..... 200vA ..... 50 cps.
H.T.: 565 CT 565v. 250mA. Choke Input.
Fils: 5v-4A 6.3v-3A 6.3v-3A.
Base: 5⅜ x 5 x 4¾" H. ..... Wgt. 15 lb. 8 oz.
Mntg: V15 ..... "S" is 2½"

D.C. Volts	Choke Input	Cond. Input
83	475v	
5Z3	430v	
5R4GY	430v	600v

Item 19. TYPE NO. 5176.

Prim: 200-230-240v. ..... 240vA. ..... 50 cps.
H.T.: 730 CT 730v. ..... 200mA.
330 CT 330v. 100mA
Fils: 5v-3A 5v-2A 6.3v-3A 6.3v-4A
Base: 4 x 5¼ x 5¾" HO. ..... Wgt. 16 lb. 12 oz.
Mntg: V12 ..... "S" is 3"

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CITY OFFICE: MU 6895 (3 lines), 157 Elizabeth St., Melbourne.

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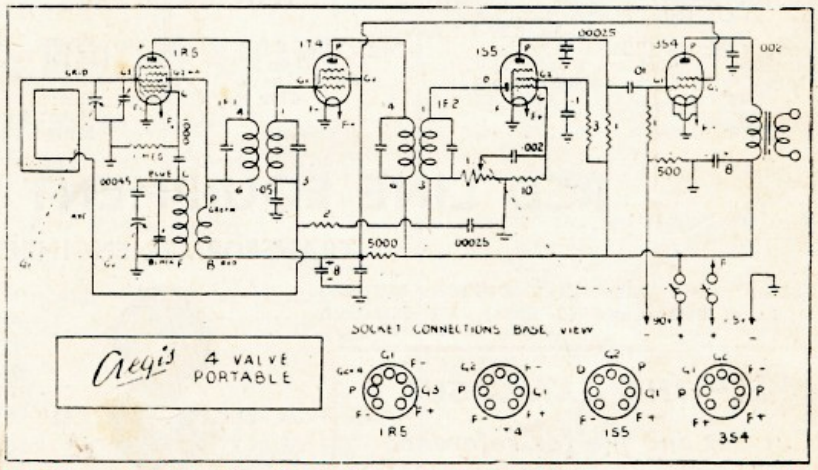

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